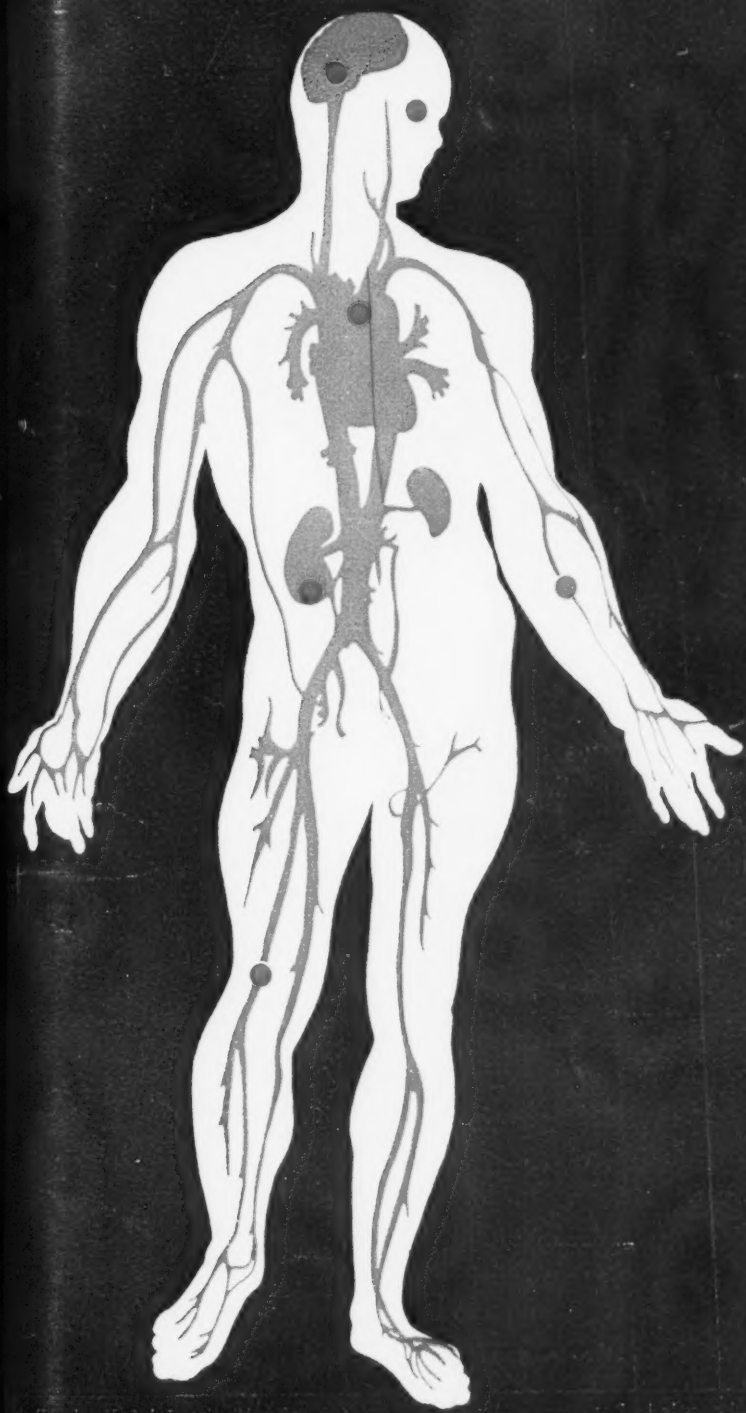
MARCH 1961

RUBBER WORLD



silicones in surgery

Du Pont means *UNIFORMITY* in Rubber Chemicals

Du Pont rubber chemicals are made to exacting standards of quality and reliability to meet rigid inspection controls.

That's why you, like so many leading manufacturers, can depend on Du Pont rubber chemicals to meet your most rigorous requirements.

This is part of Du Pont's continuing effort to provide you with dependable rubber chemicals of the highest quality and uniformity.

Accelerators	Stabilizers	Special-purpose Chemicals
Antioxidants	Peptizing Agents	Rubber Dispersed Colors
Mold Lubricants	Reclaim Chemicals	Blowing Agents

DU PONT

ELASTOMER CHEMICALS DEPARTMENT

RUBBER CHEMICALS

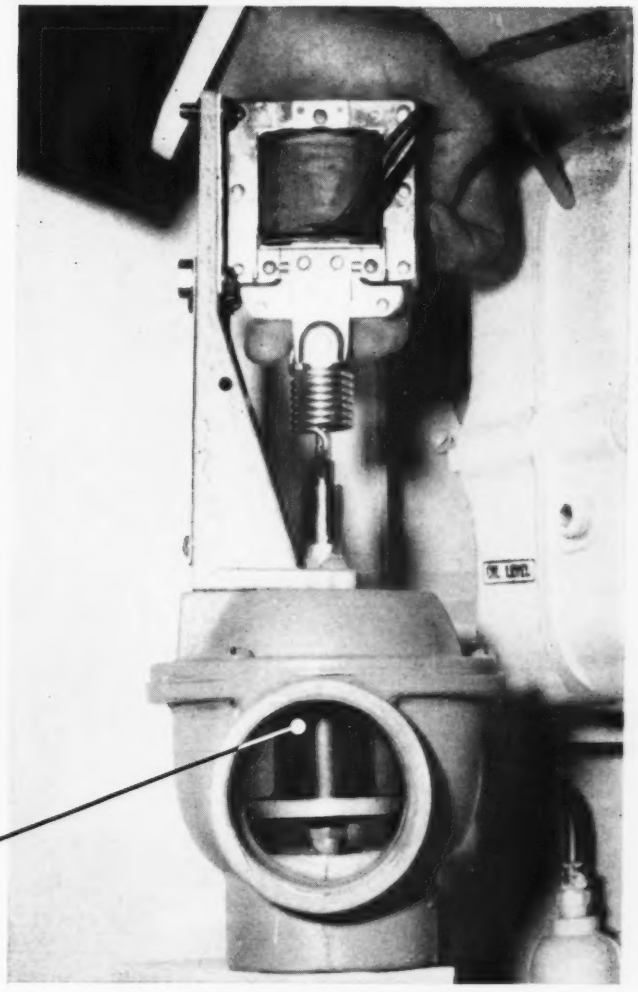
Better Things for Better Living . . . *through Chemistry*

RUBBER WORLD, March, 1961, Vol. 143, No. 6. Published monthly by BILL BROTHERS PUBLISHING CORP. Office of Publication, 3rd & Hunting Park Ave., Philadelphia 40, Pa., with Editorial and Executive Offices at 630 Third Avenue, New York 17, N. Y., U.S.A. Second Class Postage Paid at Philadelphia, Pa., under the act of March 3, 1879. Subscription United States $5.00 per year; Canada $6.00; all other countries $10.00. Single Copies 50¢ in U.S.; $1.00 elsewhere. Address Mail to N. Y. Office. Copyright March, 1961, by BILL BROTHERS PUBLISHING CORP.

Another new development using

B.F.Goodrich Chemical *raw materials*

Willard drain valves, using a diaphragm molded of Hycar by Immel Engineering, Dallas, are used in commercial washing machines manufactured by Cook Machinery, Inc., also of Dallas. B.F.Goodrich Chemical Company supplies the Hycar nitrile rubber.



Detergents tough on rubber parts as well as dirt

...till Hycar solved the problem

The drain valve for these commercial washing machines is controlled by a solenoid through a rubber diaphragm. Chemicals commonly encountered in soaps and detergents created a problem—till these diaphragms were made of Hycar nitrile rubber.

Hycar is a tough rubber—unaffected by hot water, excessive alkalinity or chemicals. It resists oils, greases, and other hydrocarbons, retaining its resilience and flexibility over a wide temperature range.

Next time you have a rubber problem to solve, it may pay you to know about the unique advantages Hycar brings. For more information, write Dept. RM-1, B.F.Goodrich Chemical Company, 3135 Euclid Avenue, Cleveland 15, Ohio. Cable address: Goodchemco. In Canada: Kitchener, Ontario.

Hycar

Rubber and Latex

B.F.Goodrich Chemical Company
a division of The B.F.Goodrich Company

B.F.Goodrich

Attend the Spring Meeting, Division of Rubber Chemistry, A.C.S. • LOUISVILLE—APRIL 19, 20, 21

RUBBER WORLD

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VISIT OUR HOSPITALITY ROOM
Division of Rubber Chemistry
-A.C.S. Convention, Louisville, Ky.
April 19, 20 and 21

PHILLIPS 66

man lived by the side of the road and sold hot dogs.
He was hard of hearing; so he had no radio.
He had trouble with his eyes; so he read no newspapers.
But he sold good hot dogs.
He put up a sign on the highway telling how good they were.
He stood by the side of the road and cried: "Buy a hot dog, Mister."
And people bought.
He increased his meat and roll orders.
He bought a bigger stove to take care of his trade.
He got his son home from college to help him.
But then something happened . . .
His son said, "Father, haven't you been listening to the radio?
If money stays 'tight,' we are bound to have bad business.
There may be a big depression coming on.
You had better prepare for poor trade."
Whereupon the father thought, "Well, my son has gone to college.
He reads the papers and he listens to the radio, and he ought to know."
So the father cut down on his meat and roll orders.
Took down his advertising signs.
And no longer bothered to stand on the highway to sell hot dogs.
And his hot dog sales fell almost overnight.
"You're right son," the father said to the boy.
"We are certainly headed for a depression."

This page is appearing in March issues of these Bill Brothers Publications: Fast Food, Modern Floor Covering, Modern Tire Dealer, Plastics Technology, Rubber World, Sales Management, and Sales Meetings. The source of the story is unknown to us, and we will be grateful to anyone who can identify it.

news of the rubber world

March, 1961

A new tire construction using two plies of nylon and two plies of rayon has been announced by Seiberling Rubber Co. According to President Seiberling and Executive VP Schrank, this tire gets the best of each cord and successfully eliminates many of the undesirable effects of each. Inner plies of nylon give strength where most needed; while outer plies of rayon stop "flat spotting," tire growth, and noise. The tread wear and cracking values are equal to those of present tires. An unexpected plus -- The tire retains more of its original strength after running than when either rayon or nylon is used alone. Available now in first-line tires, this NYTEX construction will be expanded to other lines soon. Seiberling engineers are very enthusiastic about a SUPER NYTEX tire now undergoing numerous tests. Further details next month.

The use of silicone rubber in the medical field is a very dramatic new use for rubber products. Although volume is low, and economic return uncertain at present, the well-being of those who have benefited both in body and mind from this new technique should give great satisfaction to the companies involved and the industry in general. A report on the present state of the art and summary of current uses appears on page 67.

The listing of available synthetic rubber latices which was requested by many of you has been prepared by the RUBBER WORLD staff and appears on page 71. Reprints, single or in quantity, may be obtained.

Adding stearic acid and zinc oxide to a batch simultaneously may cause poor dispersion. These common (and other) ingredients may be giving unsuspected trouble. A report on a study of this effect will be found on page 59.

How will new equipment purchases or changes in work force size affect your company's profit picture? The break-even chart is a way to test your decisions in advance. Page 63.

how to vastly increase the useful life of rubber...

Consider the effect of your curing system on the effectiveness of a chemical antiozonant

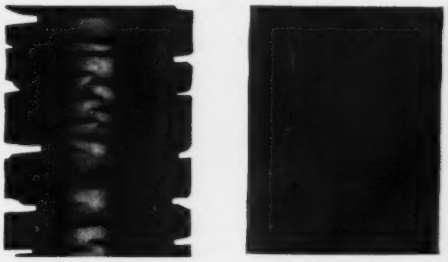
In compounding rubber, use of a potent antiozonant like UOP 88 or 288 is essential in assuring maximum crack-free life. But do you realize what a vast difference may be made by your *curing system?*

Look at the two rubber test strips illustrated. Both were formulated with UOP 88... but note how much more effectively the antiozonant worked when accompanied by this change in curing systems —a vast increase in resistance to cracking!

Help in achieving maximum effectiveness from UOP 88 or 288 antiozonants is available through UOP facilities and technical personnel. Just write or telephone our Products Department.

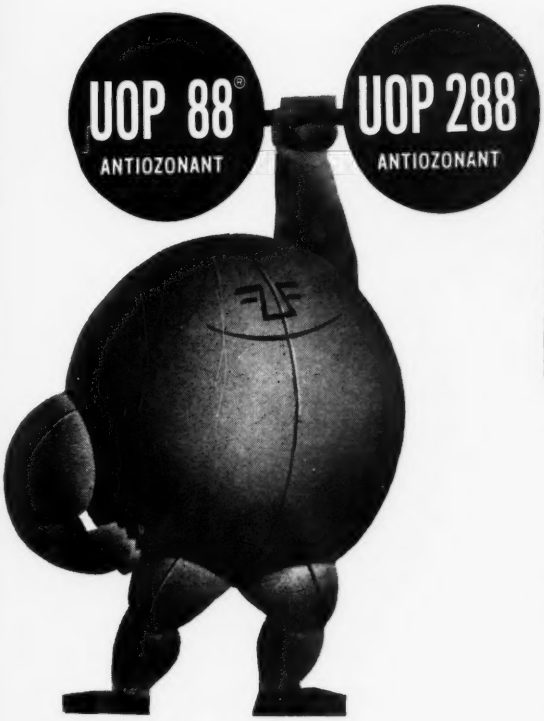
UOP ozone cabinets provide test conditions at a wide range of ozone concentrations.

The SBR specimens below were exposed to ozone at 100°F with 20 percent elongation for 52 hr. at 33 pphm ozone, then 187 hr. at 63 pphm ozone.



Carbon black—HAF (high abrasion furnace), Curing system—4 phr tetramethylthiuram disulfide; Hours to first crack—7 to 23.

Carbon black—HAF (high abrasion furnace), Curing system—2 phr sulfur, 1 phr N-cyclohexyl-2-benzothiazole sulfenamide. No cracks in 239 hr.



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WHERE RESEARCH TODAY MEANS PROGRESS TOMORROW

technical books

BOOK REVIEWS

"Rubber and Tire Friction." Engineering Research Bulletin B-80. H. W. Kummer and W. E. Meyer. Paper cover, 8¼ by 11 inches, 98 pages. College of Engineering & Architecture, The Pennsylvania State University. Copies should be ordered from: Engineering Publications, 227 Hammond Building, The Pennsylvania State University, University Park, Pa. Price, $3.00.

This monograph reports the results of research by the authors and graduate students at the University in the field of rubber friction with a review of the literature on the subject and offers several new interpretations of existing information. The initial activities of the project, according to the authors, are directed toward finding improved means to stop a vehicle that is in motion.

The first portion of the report is concerned with the mechanism of rubber friction and should be of great interest to all rubber technologists. The classic laws and theories are reviewed; the various mechanisms of rubber friction are discussed, and several factors involved in each of the mechanisms are covered.

The second section of the book covers frictional characteristics of pneumatic tires and should be of great help to anyone directly concerned with highway safety, such as tire and brake system engineers; engineers concerned with construction and maintenance of roads, the application, preparation, and development of surfacing materials; and safety experts. Factors covered include apparent pressure, sliding velocity, temperature, contamination and water film, and the problem of water removal. Each factor is subdivided into several discussions of pertinent conditions.

The book includes summaries of each section, an extensive list of references, and an appendix outlining laboratory techniques, road friction testing, remarks on the stopping distance method, and a complete description of the Penn State brake test trailer.

"Tires and the Road." The German Section of the International Rubber Institute, Frankfurt/Main, Germany. 25-page pamphlet.

This booklet contains condensed versions of the five papers presented by German authors at the International Natural Rubber Symposium held in Paris May 20-22, 1960, sponsored by the Institut Français du Caoutchouc.

It is in German, illustrated, and includes the following papers:

"Reciprocal Reactions between Tire and Road in Straight Ahead Driving," by W. Hoffenberth, Deutsche Dunlop Gummi Compagnies, A.G., Hanau.

"Deformation Measurements on Tires with the Extensometer," by W. F. Kern, Metzeler Gummiwerke, A.G., Munich.

"New Testing Apparatus for Examining Tires for Motor Vehicles," by K. Kollmann, Karlsruhe Technical Institute.

"The Influence of the Tire on Vehicle and Road," by M. Mitschke, Braunschweig Technical Institute.

"Observations on Skid-Resistance on Icy, Snow-Covered Roads," by B. Wehner, Berlin Technical University.

NEW PUBLICATIONS

"Rubber and Plastics Machinery." Stewart Bolling & Co., Inc., Cleveland, O. 32 pages. The brochure, Part I of the twenty-third edition of the company's catalog on hydraulic presses, pumping units, elevators, bale cutters, and vulcanizers, includes listing of several new presses, and the Bolling breech block, incorporated in standard equipment.

"What's Behind the Green Line?" Enjay Chemical Co., division of Humble Oil & Refining Co., New York, N. Y. This folder on Enjay HT 10-66, chlorinated butyl, contains slide-rule filler and cure systems selector.

"Kelm Shrinkage and Draft Calculator." Kelm Mfg. Co., Coloma, Mich. Plastic slide chart contains charts of decimal tables, drill sizes, and hardness conversions as well as shrinkage table.

Publications of Boston Insulated Wire & Cable Co., Boston, Mass.:

"Single and Multi-Conductor Cable with Silicone Rubber." 4 pages. This bulletin describes various kinds of silicone-insulated cable, such as power and lighting cable, hook-up wire, ignition cable, and conductor cable for shipboard, missiles, and nuclear power purposes.

"Wire and Cable Application Case Histories." 4 pages. This bulletin discusses case histories involving radiation-resistant cables and miniaturized switchboard wires, using silicone rubber insulation.

"Naugatuck Chemical Latices." Naugatuck Chemical Division, United States Rubber Co., Naugatuck, Conn. 5 pages.

"Portable Belt Conveyors." Bulletin No. 300. Rapids-Standard Co., Grand Rapids, Mich. 4 pages.

"Knife Cutters." Bulletin K-460A. Robinson Division, The Young Machinery Co., Muncy, Pa. 6 pages.

(Continued on page 46)

PLIOFLEX "C" cuts tire cost by seven cents or more!

A Goodyear exclusive—the incorporation of WING-STAY 100 in PLIOFLEX "C" rubbers during manufacture—can mean an antiozonant saving of ¾ cents per pound of rubber or at least seven cents per tire, depending on its size.

No ordinary stabilizer, WING-STAY 100 first protects the rubber through manufacture and processing. Then it serves outstandingly well as your base antioxidant *and* antiozonant.

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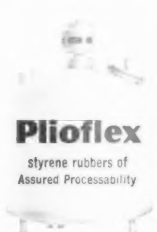

Lots of good things come from

GOODYEAR

CHEMICAL DIVISION

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Rest assured! The best is pure rubber latex foam

Sit on it, lounge on it, walk on it—not once, but time after time, year after year—and you're bound to be a pure rubber latex foam fan for life! Foams made of other materials just can't compare for comfort. 100% rubber latex foam is marvelously buoyant. And it "breathes"! No hot, sticky feeling ever.

Add to these comforting advantages the remarkable flex- and *stress-life of rubber latex foam.* It takes plenty of punishment—and bounces back for more. Then, whether you just use, *or manufacture,* furniture, automobiles, carpeting, shoes, clothing or other products that need cushioning, you *know* you'll always rest easy, rest best, with pure rubber latex foam.

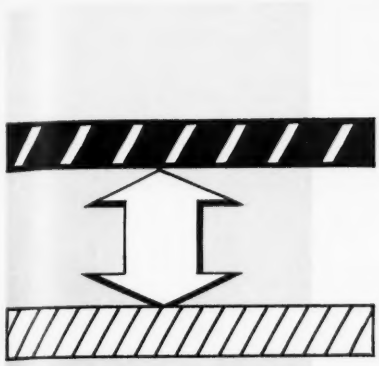
Another reason for resting easy is this: you'll find the touch of Goodyear quality behind many rubber latex foam products today. Reason? Goodyear manufactures several latices for them, including PLIOLITE 5352. Want more details? Just write Goodyear, Chemical Division, Dept. C-9418, Akron 16, Ohio.

Lots of good things come from

GOODYEAR

CHEMICAL DIVISION

Pliolite—T. M. The Goodyear Tire & Rubber Company, Akron, Ohio



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to

metal

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VERSATILITY...

Chemlok 220/203 system bonds natural rubber, SBR, butyl, neoprene and nitrile elastomers to all metals and many rigid plastics. No need to inventory several adhesives. You also save storage space and avoid errors in adhesive application.

LESS SCRAP...

Chemlok Adhesives produce rubber-tearing bonds consistently. You save through fewer rejects, fewer bond failures, improved product acceptance.

ONE COAT...

Single coat of Chemlok 220 outperforms most two-coat systems, gives equivalent environmental resistance. You save through less adhesive, less labor, shorter processing time.

BROAD TOLERANCE...

Chemlok Adhesives permit wide latitude in compounding, surface preparation, adhesive application, metal parts handling and molding techniques. Adaptable to existing processing methods and equipment. You save through faster handling, simpler processing, standardized procedures.

BETTER QUALITY...

Chemlok Adhesives give uniform, high-strength bonds with maximum service life and environmental resistance. You save the high cost of customer complaints and lost business.

How Chemlok Adhesives cut costs at Johnson Rubber Co.

"We get 80 to 90% better bonding results with Chemlok 220 and 203," reports Mr. George Green, Lab Supervisor at Johnson Rubber Co., Middlefield, Ohio.

"Chemlok Adhesives permit us to stock only one bonding agent where formerly we had a different one for each type of rubber. This saves on equipment and space, also reduces adhesive storage areas and costly inventories."

Using Chemlok 220 and 203 for automotive parts, Johnson Rubber achieves longer product life, more uniform bonding, and better consistency with easier control and up to 20% less scrap.

hughson

Watch Hughson—for progress through creative research

For better bonding at lower cost, investigate Chemlok Adhesives—the leading rubber-to-metal adhesives. Write for samples and technical literature.

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A Division of Lord Manufacturing Co.
Erie 6, Pennsylvania

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Factice®

VULCANIZED VEGETABLE OIL TO YOUR COMPOUND

for Reduction in Milling Time and Better Dispersement of Fillers.

Typical products using Factice "White" in compounding formulas.

Until the introduction of Amberex, another type of Factice®, white Factice® was the only vulcanized vegetable oil which could be used in light-colored goods, such as those shown above, where good calendering properties and smooth stock are essential.

Rapeseed oil produces the driest white Factice®, and this type may contain mineral oil or fillers. Compounders have found that for a loaded stock it is advantageous to use this rapeseed Factice® white, containing fillers, to reduce milling time of the compound and to improve the dispersion of fillers. Send us your compounding formula for our suggestions. All formulas held in strict confidence. Our trained staff will help in selecting the proper vulcanized vegetable oil for your need . . . Factice® White, Brown, Neophax or Amberex.

THE STAMFORD RUBBER SUPPLY CO.
STAMFORD, CONN.

new materials

Royal RM Sulfurs

H. M. Royal, Inc., Trenton, N. J., supplier of chemicals, plasticizers, and fillers to the rubber industry for more than 35 years, has announced a new line of Royal RM Sulfurs, which are described as high-quality Rubbermaker's sulfurs at competitive prices.

In addition to the guaranteed purity of 99.9%, plus, the new line possesses low ash, carbonaceous matter, moisture, and acidity contents.

The company also offers improved non-skid "Duo-stress" outer bag construction, coupled with "Clu-Pak" inner construction for its products, which, it claims, is one of the finest packages on the market today.

Small or full-bag samples are available at no charge upon receipt of request indicating the fineness specifications desired.

Philprene 1609

Philprene 1609, a cold SBR black masterbatch containing 40 parts of SAF black, has been introduced by Phillips Chemical Co., Akron, O. The masterbatch uses a rosin acid soap emulsifier and a staining antioxidant. It is recommended for use in premium tire treads, super-premium retreads, belt coverings, and other compounds demanding top physical properties.

Ameripol 4756

Ameripol 4756, an oil-extended black masterbatch, has been introduced by Goodrich-Gulf Chemicals, Inc., Cleveland, O. The product is a cold, mixed-acid emulsified, staining SBR, with 37.5 parts of aromatic oil and 75 parts of HAF black. It is recommended for tread stock, extruded and molded mechanical goods, and belting.

Pliolite Latex 176

Pliolite Latex 176, an SBR copolymer, is now being marketed by The Goodyear Tire & Rubber Co., chemical division, Akron, O.

The features of good aging resistance, low odor, high adhesion, compounding ease, high pigment bind power, and mechanical stability suggest its use in textile sizings and upholstery and carpet backings.

Improve high-temperature aging resistance of Neoprene Latex with MERAC®

- Maintains physicals well after aging
- Improves tensile and elongation values
- Minimizes thermal discoloration
- Reduces precure and other processing problems

The latest study in Pennsalt's continuing evaluation of latex accelerator systems shows that Merac offers significant improvements over thiocarbanilide in Neoprene. Complete results of this study are now available in Bulletin S-165. For your copy, ask your Pennsalt representative or write Industrial Chemicals Division, PENNSALT CHEMICALS CORPORATION, Three Penn Center, Philadelphia 2, Pa.

Base Compound

Component	PHR (dry basis)
Neoprene latex, type 571	100.0
Aquarex D*	0.5
ZnO	5.0
Ammoniated casein	0.5
Pennox A	2.0
TiO_2	25.0

*E. I. du Pont de Nemours & Co., Elastomer Chemicals Dept.

	Thiocarbanilide 1.0 PHR						Merac 2.0 PHR						Merac 6.0 PHR					
Cure Min @ 280°F	No aging			Aged 40 hours @ 280°F			No aging			Aged 40 hours @ 280°F			No aging			Aged 40 hours @ 280°F		
	M500	T	E	M500	T	E	M500	T	E	M500	T	E	M500	T	E	M500	T	E
45	630	1220	690	—	700	350	400	2050	960	—	1000	450	500	2400	900	1100	1450	600
60	700	1540	700	—	800	380	480	2020	940	—	920	420	500	2500	910	1000	1450	590
75	680	1100	600	—	810	400	480	2100	870	—	920	410	580	2250	875	970	1400	600

Pennsalt® Chemicals
ESTABLISHED 1850

SEE OUR COMPLETE LISTING IN CHEMICAL MATERIALS CATALOG

INDUSTRIAL CHEMICALS DIVISION

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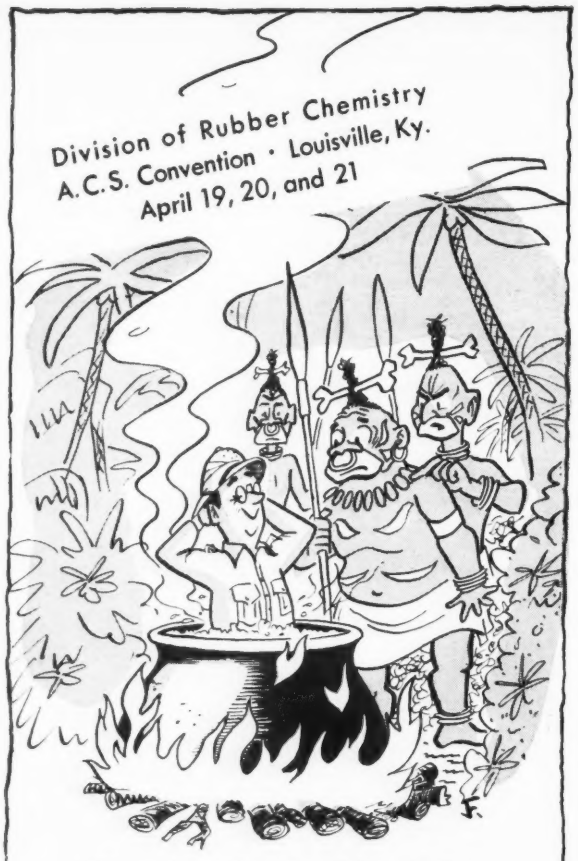
AIRCO COMPANY INTERNATIONAL, NEW YORK



The only explanation I have is that he must be in the neoprene business— and knows that MAGLITE is the key to superior scorch protection.

Maglite®

The performance-proved magnesium oxide

Want to eliminate scorch damage in neoprene processing? Specify MAGLITE D. Tests prove that it offers better scorch protection for neoprene than any other magnesium oxide you can use. MAGLITE D also helps solve storage problems since it occupies about one-third the warehouse space as many of the lightweight magnesias. The benefits of using MAGLITE K, M, or Y for other elastomers and certain product or process requirements are equally impressive. For samples and technical information write to MERCK & CO., INC., Marine Magnesium Division, Department RA-2, Rahway, New Jersey.

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new materials

Modified Polybutadiene— Hycar 1000X145

A new modified polybutadiene polymer called Hycar 1000X145 has been announced by B. F. Goodrich Chemical Co., Cleveland, O. The company claims that the polymer has excellent abrasion resistance and will not become brittle even at temperatures as low as −85° F., and that it has moderate resistance to the effects of fuels, solvents, and chemicals.

Goodrich says that these characteristics coupled with the polymer's excellent electrical properties and ozone resistance make it useful in electrical wire and cable applications by eliminating the need of different materials for use in the primary insulation and the protective sheath. Other applications foreseen for the new material include shoe soles and heel lifts, machine parts where abrasion resistance is important, hose coverings, and as a coating material for fabrics.

Silastic RTV 601

A free-flowing fluid silicone rubber that vulcanizes in sections of unlimited thickness at room temperature, Silastic RTV (room temperature vulcanizing) 601, is being marketed by Dow Corning Corp., Midland, Mich. The product requires only the addition of a catalyst and 24 hours' time to set up into a rubbery solid. The manufacturer says it cures without heat, pressure, or moisture even under airtight conditions. No volatile by-products are produced by the vulcanization reaction.

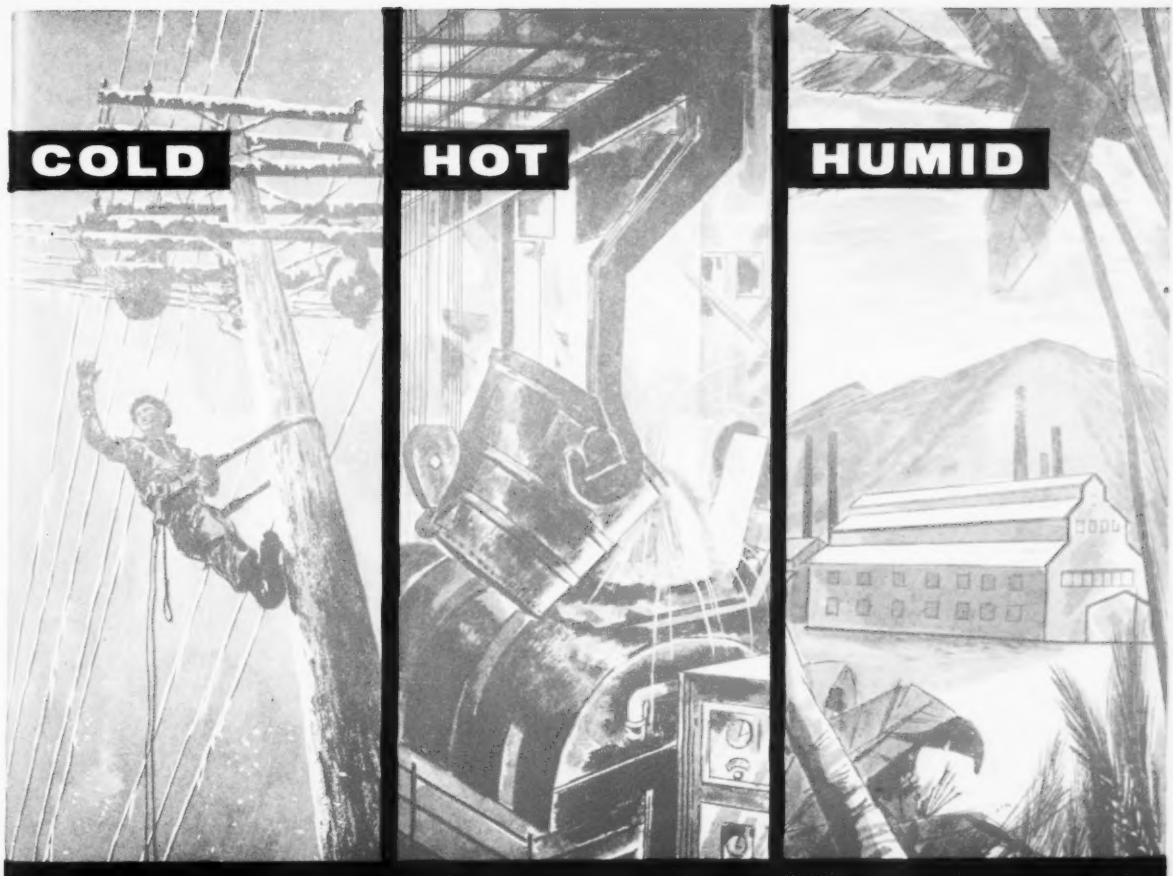
RTV 601 is recommended for applications from the making of flexible molds and casting of prototype parts to potting and encapsulating deep or totally enclosed electrical and electronic components.

Tertiary Butyl Peroxide

U. S. Peroxygen Corp., Richmond, Calif., has added tertiary butyl peroxide to its line of organic peroxides. The product, known as di-tertiary butyl peroxide, is used as a polymerization catalyst for high molecular weight polymers such as polyisoprene, vinyl silicones, styrenated alkyds, polymerized oils, polystyrene, polyacrylates, and high styrene resins.

The product is 97% pure. It is readily soluble and has a specific gravity of .791 at 20/20°C.

"Regal SRF, A Semi-Reinforcing Furnace Black Made from Oil." Bulletin TR-7. Cabot Carbon, Ltd., London, England. 6 pages.



for electrical insulation that must take it...

MARBON 8000® AE

REINFORCING HIGH-STYRENE RESIN

In frigid northern climate or in the humid tropics . . . for use with hot industrial machinery or with telephone wires . . . electrical insulation compounds, modified with Marbon 8000 AE resin give superior performance.

This hydrocarbon resin also offers proven production advantages: fast, smooth extrusion at lower mixing temperatures, with less scorch . . . good resistance to heat aging . . . high tear and cut resistance . . . low moisture pick up . . . maximum electrical properties and flexibility of compounding with reduced overall cost.

For your next SBR wire insulation compound that must really take it, specify Marbon 8000 AE resin.

Write Today for Complete Information

MARBON CHEMICAL
WASHINGTON

MARBON CHEMICAL B-W BORG-WARNER

DIVISION **BORG-WARNER**
WEST VIRGINIA

RECLAIMATOR® RUBBER...

... saves money, too!

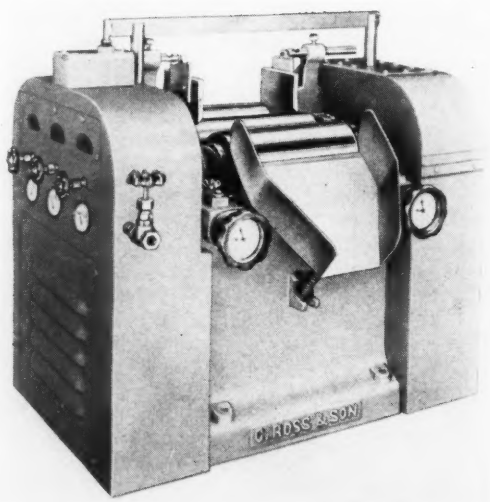
Good "balance" with RECLAIMATOR rubber in your compound will lead to "free-wheeling" profits.

You can save money with RECLAIMATOR rubber because, not only is it easier to process, it gives you more usable mixer space, permitting an average 10% increase in batch size. These larger Banbury loadings mean money in your pocket. Moreover your Banbury time is cut down because faster mixing RECLAIMATOR rubber gives you an average reduction in mixing time of 15%. Also the better plasticity means a lower horsepower requirement and less wear on the mixer. Let us give you more reasons why we believe RECLAIMATOR rubber will benefit you.

WRITE FOR LITERATURE
Shows why RECLAIMATOR rubber should be in your compound.

U.S. **RUBBER RECLAIMING CO., INC.**
BUFFALO, N. Y. VICKSBURG, MISS.

new equipment



High-speed three-roll mills

Three-Roll Mills

New high-speed three-roll mills fitted with roll pressure recording gages and automatic thermostatic controlled water inlet valves have been introduced by Charles Ross & Son Co., Inc., Brooklyn, N. Y.

The pressure recording gages built into each adjusting hand-wheel assure positive parallel roll settings for uniform dispersions and eliminate uneven wear on rolls, enable returning to predetermined roll settings without guesswork, and insure the same results every time.

All of the mills are provided with automatic thermostatic control of main inlet or water cooling line for limiting the heat of rolls to a preset temperature between 40-180° F.

New Combination Rack

A combination truck and drain rack designed for users of solvents, cutting oils, and detergents has been introduced by The Palmer-Shile Co., Detroit, Mich. A downward push on the truck will raise wheels and lay rack on floor for convenient drainage. Truck is of all-welded construction, made of heavy angle iron frame with steel tubing handles and roller bearing wheels.

(Continued on page 20)

An example of Avisco Rayons in Industry

Now, stronger, lighter-weight belts with Avisco XL-I rayon

Because of fabrics made from Avisco XL-I rayon fiber it is now possible to engineer stronger, lighter-weight belts.

Compared to the traditional fiber, fabrics of XL-I rayon have up to 60% greater tensile strength and 3 to 5 times the fatigue life.

XL-I rayon adheres without predipping. Flex characteristics are excellent. XL-I fabrics trough well, conform better to pulleys and rollers, readily absorb starting and shock loads. Their lighter weight requires less power for starting and running.

For help in improving your product with Avisco XL-I rayon reinforcement, send in the Quick Reply Coupon.

QUICK REPLY COUPON 3-18

Industrial Merchandising Division
American Viscose Corporation
350 Fifth Avenue, New York 1, N. Y.

Please contact me about Avisco Rayons for use in the following application:

_____

Name_____

Company_____

Address_____

City_____ Zone____ State_____

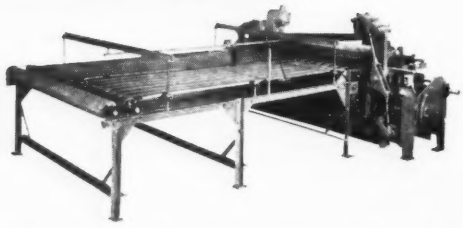
AVISCO® AVISCO® RAYON

AMERICAN VISCOSE CORPORATION, 350 Fifth Avenue, New York 1, N. Y.

ALFA CUTTERS

3 Precision-Built Machines Designed For A Wide Variety of Cutting Jobs!

AUTOMATIC STOCK CUTTER



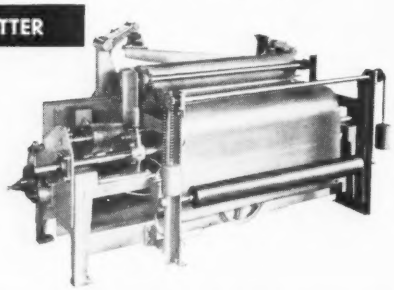
• A high production, self-contained machine, the Alfa Stock Cutter is complete with motors, variable speed control, synchronizer and conveyors. Measures and cuts to length a continuous material flow from processing machines or yardage rolls.

Quickly and easily adjusted to cut infinite lengths. A clean accurate cut is assured and design is flexible to suit conditions.

Sizes: 30" — 42" — 60" — 72" — 84" — 90".

BATT CUTTER

Cotton
Fiber-Glass
Felts
Padding
Plastics
Rubber



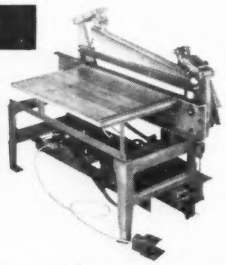
• For automatic cutting of yardage rolls or may be synchronized to a continuous processing line. Accurately cuts wide range of materials — battings, plastics, textiles, paper, rubber stock and sponge. Fully self-contained, the machine is complete with motor and synchronizer and meets a wide range of cutting problems.

Length of cut is variable and easily regulated by quick change gears or other means depending on requirements.

Sizes: 30" — 42" — 60" — 72" — 84" — 90".

ELECTRIC POWER SHEAR

Rubber
Foam
Sponge
Vinyl
Paper Board
Textiles



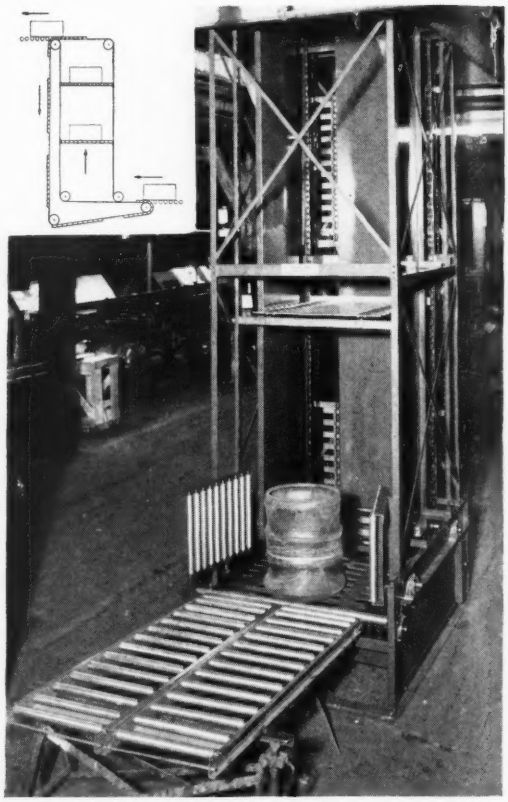
• A compact heavy duty machine, designed for manual operation. Ideal for many cutting requirements — handles materials from flat folds, rolls or sheets. The clamp is automatic and adjustable for pressure and clearance. The table is heavy wood construction with metal straightedge. The foot switch activates the knife and can be placed in any position convenient to the operator.

Sizes: 36" — 48" — 60"

SPADONE MACHINE CO. INC.

SOUTH NORWALK, CONNECTICUT • Phone: VOlunteer 6-3394
Illinois Office: P.O. Box 328, LaGrange • Phone: FLeetwood 4-4811
Representative for Alfa Machine Co.

new equipment



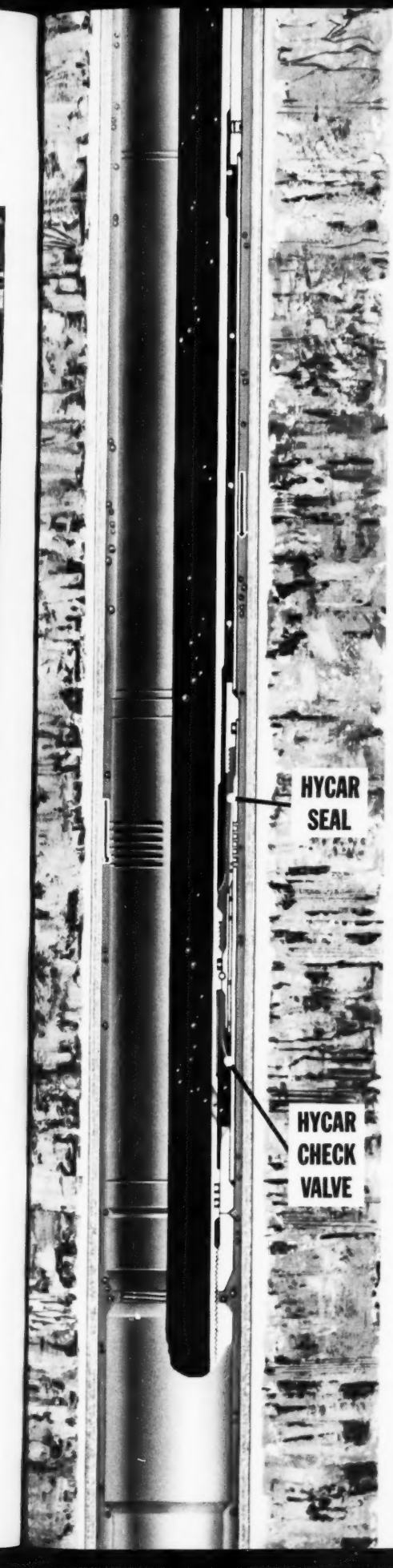
The Escaveyor, shown here lifting a green tire, is a new self-loading and unloading continuous conveyor introduced by Standard Conveyor Co., North St. Paul, Minn. This system is recommended for lifting or lowering commodities where freight elevators are too slow and lack of space prohibits installation of an inclined belt conveyor. As shown in inset, platforms made of connected bars are pulled into horizontal position to serve as elevators. When the load reaches the top, the load is rolled off and the platforms are pulled into a vertical position for the return run.

Flexible Tube Cutting Machine

General Development Corp., Trenton, N. J., is now manufacturing a machine which cuts to length fabric-covered steel-wired flexible tubing.

A pair of wire cutting blades penetrates the cloth from beneath, cuts the wire, and moves it out of the way of the band knife blade which cuts down from above. A safety device prevents the band blade from moving through its cycle when the machine is set in motion without a tube in place, or when the wire cutters have not performed their operation. The machine is adjustable for many tube diameters.

(Continued on page 26)



Another new development using

B.F.Goodrich Chemical

raw materials

HYCAR SOLVES GAS PENETRATION PROBLEM

Pressure differentials from the depths of an oil well to the surface create problems with most rubbers. Gas absorbed at the bottom of a well creates explosive force inside parts when they reach the top. For a long time, the manufacturer of this gas lift valve had been searching for a rubber that is sufficiently dense to withstand gas penetration. His tests showed that Hycar nitrile rubber provides the answer. Here's the report:

"Our penetration tests consist of applying a pressure of 800 psig natural gas on one side, with the other side of a slab of rubber sealed to atmosphere. There was no penetration for 96 hours. This is the only resilient material we have found that shows no signs of penetration in this test. As a result, we standardized on Hycar rubber."

In addition, this manufacturer wants properties hard to find in resilient materials—but which are provided by Hycar. They include good shear resistance, elasticity, ability to withstand hot water without shrinkage or hardening, and ability to withstand crude oils with a minimum of swelling and deterioration.

It's no wonder that Hycar is again and again the choice for tough oil field rubber problems. For more information write Dept. MC-2, B. F. Goodrich Chemical Company, 3135 Euclid Ave., Cleveland 15, Ohio. In Canada: Kitchener, Ontario.

This Type C Otis Gas Lift Valve uses Hycar resilient elements developed by Murray Rubber Company, Houston, for the valve manufacturer, Otis Engineering Company, Dallas. Both Murray and Otis participated in thorough testing of Hycar to test its resistance to gas penetration before selection of material for these parts. B.F.Goodrich Chemical Company supplies the Hycar nitrile rubber.

Hycar

Reg. U.S. Pat. Off.

Rubber and Latex

B.F.Goodrich Chemical Company

a division of The B.F.Goodrich Company

B.F.Goodrich

GEON vinyls • HYCAR rubber and latex

GOOD-RITE chemicals and plasticizers

Another new development using

B.F.Goodrich Chemical *raw materials*

THIS NEW HYCAR RUBBER OFFERS UNIQUE COMBINATION OF PROPERTIES

HYCAR 1000X145. Makers of a variety of products should find the advantages of this new modified polybutadiene polymer of interest. Its abrasion resistance is excellent—as is its lack of brittleness at low temperatures. Electrical properties are good; ozone resistance is good. Oil resistance is moderate.

Suggested applications include primary electrical insulation, shoe soles and heel lifts, rolls where abrasion resistance is important, on coated fabrics and hose coverings.

If you would like samples or more information on Hycar 1000X145, or any other Hycar rubbers and latices, write Department FA-9, B. F. Goodrich Chemical Co., 3135 Euclid Ave., Cleveland 15, O. Cable address: Goodchemco. In Canada: Kitchener, Ontario.

Hycar Rubber and Latex

B. F. Goodrich Chemical Company
a division of The B. F. Goodrich Company

See our catalog in Sweet's Product Design File

B.F.Goodrich GEON vinyls • HYCAR rubber and latex • GOOD-RITE chemicals and plasticizers

Question:

Looking for a good non-staining rubber anti-oxidant?

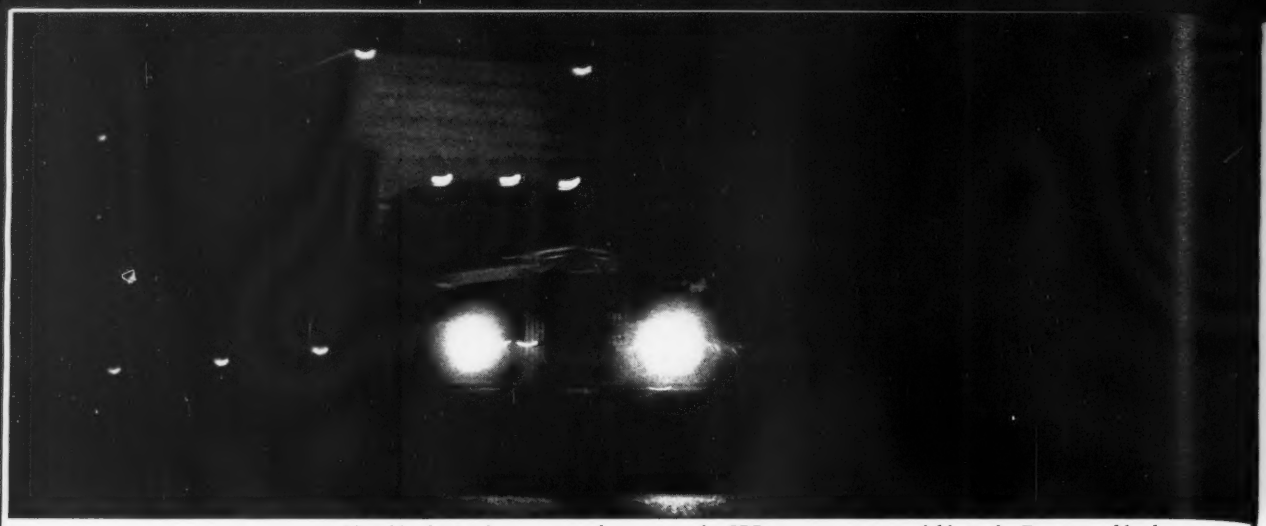
Answer:

Then you should consider the Neville Nevastains — Nevastain A, if you prefer liquid form and Nevastain B, in solid, flaked form for ease of weighing and handling. Both Nevastains are highly compatible with synthetic or natural rubbers, and result in a desirable retention of tensile strength, elongation, hardness and color after aging. The non-staining aspects of the Nevastains make them ideally suited to light-colored stocks. They are much lower in price than their virtues would indicate. Write for Technical Service Reports.

	Nevastain A	Nevastain B
Specific Gravity @ 15.6/15.6°C....	1.080-1.090	1.090-1.110
Color	Straw	Light Amber

Neville Chemical Company · Pittsburgh 25, Pa.

NEVILLE®



Mixed loads of polyisoprene and many popular SBR types are now available in the East at truckload prices.

BULLETIN:

Shell Chemical offers immediate shipment of mixed loads of Shell Isoprene Rubber and SBR at carload prices

Shell Chemical offers SBR polymers, latices and new Shell Isoprene Rubber—all from a single source.

Here is how you can get immediate shipments of these polymers from Torrance, California. And how Eastern manufacturers can now purchase mixed loads of Shell Isoprene Rubber and various popular SBR types at standard truckload prices.

IN OCTOBER, 1960, Shell Chemical boosted polyisoprene rubber production capacity to over 3,000,000 pounds a month.

As a result, car or truckload lots of this new rubber are now available for immediate shipment. Mixed loads of polyisoprene and any of Shell's SBR polymers can also be ordered. They will be shipped from Torrance, California, at applicable carload prices.

Warehouses from coast to coast

Shell Chemical also stocks new Shell Isoprene Rubber and a variety of SBR polymers at eight warehouses. Their locations are: Boston, Trenton, Baltimore, Lima, Nashville, Chicago, Portland and Los Angeles.

Eastern and Midwestern firms can now purchase these SBR polymers with Shell Isoprene Rubber to round out loads meeting minimum tariff weights required for carload prices.

SHELL'S POLYMER GUIDE

The following polymers are available from Torrance, California. To order, call your nearest Shell Chemical, Synthetic Rubber Division sales office.

Polyisoprene

New Shell Isoprene Rubber. The first commercially made polymer to unite the advantages of natural and synthetic rubber. These include: high resilience, low heat build-up, excellent mold flow, uniformity, freedom from contamination, light color and ease of processing.

Because Shell Isoprene Rubber's molecular structure is *cis*-polyisoprene—the same as nature's product—it can be used for products that require natural rubber.

Since its initial introduction, manufacturers have found it suitable for heavy-duty truck tires, surgical tubing, toys, rubber thread, shoe soles and heels and dozens of other applications.

New Shell Isoprene Rubber is available in handy 65-pound bales.

Hot nonpigmented nonstaining

In addition to long-established S-1000, S-1002 and S-1006, Shell makes the following hot, clear polymers:

S-1009. Fatty acid soap—salt-acid coagulant. Cross linked with divinyl benzene, it imparts dimensional stability in extruded stocks and reduces mill shrinkage.

S-1011. Rosin acid soap—salt-acid coagulant. Uses include floor tile, pressure-sensitive tape, shoe soles and heels, wringer rolls, sporting goods and toys.

S-1013. Fatty acid soap—alum coagulant—high thermoplasticity. This gel-free 43% styrene polymer is used in adhesives, sealants and coated fabrics.

REMINDER: A.C.S. CONVENTION, LOUISVILLE, KENTUCKY, APRIL 19, 20 AND 21.

BULLETIN, CONTD.

S-7501. Fatty acid soap—alum coagulant. A low viscosity rubber. It is especially suitable for open and closed cell sponge and in battery cases and other highly loaded compounds where fast, easy processing is required.

Cold nonpigmented staining

S-1500. Rosin acid soap—salt-acid coagulant. *The* polymer for tire treads. Its uses also include hose and molded goods.

Cold nonpigmented nonstaining

S-1502. Mixed acids soap—salt-acid coagulant. This light-colored rubber is used for tires, mechanical goods, shoe soles and heels, wringer rolls and toys.

S-1509. Mixed acids soap—alum coagulant. *A low viscosity*, light-colored polymer. It is ready for immediate processing in sponge soling or rug underlay. Also used in molded and mechanical goods and mold-on shoe soling.

Cold black masterbatch

These Shell polymers are used in tires, tread rubber and mechanical goods. They provide the manufacturer a cleaner, more convenient operation. Nonstaining S-1605 is used in tire carcasses.

S-1600. Rosin acid soap—salt-acid coagulant. Contains 50 parts HAF black to 100 parts S-1500.

S-1602. Mixed acids soap—salt-acid coagulant. Contains 50 parts HAF black to 100 parts S-1502.

S-1604. Rosin acid soap—salt-acid coagulant. Contains 60 parts ISAF black and 10 parts highly aromatic processing oil to 100 parts of S-1500.

S-1605. Fatty acid soap—salt-acid coagulant. This *nonstaining* masterbatch contains 50 parts FEF black to 100 parts polymer.

S-1606. Rosin acid soap—salt-acid coagulant. Contains 52 parts HAF black and 10 parts highly aromatic processing oil in 100 parts S-1500.

S-1607. Rosin acid soap—salt-acid coagulant. Contains 60 parts HAF black and 10 parts highly aromatic processing oil in 100 parts S-1500.

S-7652. Mixed acids soap—salt-acid coagulant. It is nonstaining and contains 50 parts EPC black in 100 parts low viscosity rubber.

S-1608. Rosin acid soap—salt-acid coagulant. Contains 52 parts ISAF black and 12.5 parts highly aromatic oil in 100 parts S-1500.

Cold nonstaining oil-extended

These low-cost, light-colored Shell polymers are ideal for tires, shoe soles and heels, floor tile, sporting goods, toys, molded and extruded mechanical goods.

S-1703. Mixed acids soap—salt-acid coagulant. This light-colored polymer contains 25 parts naphthenic oil in 100 parts rubber.

S-1707. Rosin acid soap—salt-acid coagulant. It is light-colored and contains 37.5 parts naphthenic oil to 100 parts rubber.

S-1778. Mixed acids soap—salt-acid coagulant. This light-colored polymer contains 37.5 parts naphthenic oil to 100 parts rubber.

S-7702. Fatty acid soap—salt-acid coagulant. This polymer contains 50 parts naphthenic oil to 100 parts rubber. Provides excellent color and color stability.

Cold staining oil-extended

These moderately priced Shell polymers are used for applications that do not call for light color. These include tires, wire and cable insulation and molded or extruded mechanical goods.

S-1709. Rosin acid soap—salt-acid coagulant. Contains 37.5 parts aromatic oil in 100 parts rubber.

S-1710. Mixed acids soap—salt-acid coagulant. Contains 37.5 parts aromatic oil in 100 parts rubber.

S-1712. Mixed acids soap—salt-acid coagulant. Contains 37.5 parts highly aromatic oil in 100 parts rubber.

Cold oil-black masterbatch

These Shell polymers are made for convenient use in tires, tread rubber and extruded goods.

S-1800. Mixed acids soap—salt-acid coagulant. Contains 60 parts ISAF black and 10 parts highly aromatic processing oil to 100 parts S-1712.

S-1802. Mixed acids soap—salt-acid coagulant. Contains 60 parts HAF black and 14 parts highly aromatic processing oil to 100 parts S-1712.

S-1803. Mixed acids soap—salt-acid coagulant. Contains 40 parts HAF black to 100 parts S-1706.

S-1806. Rosin acid soap—salt-acid coagulant. This nonstaining rubber contains 44 parts FEF black to 100 parts S-1707.

S-1807. Rosin acid soap—salt-acid coagulant. Contains 55 parts ISAF black to 100 parts S-1709.

S-1808. Mixed acids soap—salt-acid coagulant. Contains 55 parts HAF black and 9 parts highly aromatic processing oil in 100 parts S-1712.

S-7757. Mixed acids soap—salt-acid coagulant. Contains 55 parts FEF black and 5.5 parts highly aromatic oil in 100 parts S-1712.

S-1815. Mixed acids soap—salt-acid coagulant. This nonstaining rubber contains 55 parts HAF black and 9 parts naphthenic oil to 100 parts S-1778.

Resin-rubber masterbatches

These special products offer convenience. They eliminate resin dust problems, and shorten mixing time, making lower mixing temperatures possible. They are used in shoe soles, floor tile and hard rubber goods and are available in bales or free flowing crumb form.

SP-102. Contains approximately equal parts of high styrene resin and S-1502 rubber which has a viscosity range of 46-58.

SP-103. Contains approximately equal parts of high styrene resin and S-1509 rubber which has a viscosity range of 30-38.

COMPLETE INFORMATION

For more technical information contact one of these Shell Chemical sales offices: Stamford, Connecticut, DAvis 5-1581; Rocky River, Ohio, EDison 3-0600 and Lakewood, California, SPruce 3-4997.

Shell Chemical's *new* synthetic rubber catalog includes complete details on all Shell polymers and latices. For a copy, write Shell Chemical, P. O. Box 216, Torrance, California.

A Bulletin from

Shell Chemical Company

SHELL

Synthetic Rubber Division

Vulcanized
vegetable
oils
rubber
substitutes

Types, grades and blends for every purpose, wherever Vulcanized Vegetable Oils can be used in production of Rubber Goods — be they Synthetic, Natural, or Reclaimed.

A long established and proven product.

THE CARTER BELL MFG. CO.

SPRINGFIELD, NEW JERSEY

Represented by
HARWICK STANDARD CHEMICAL CO.
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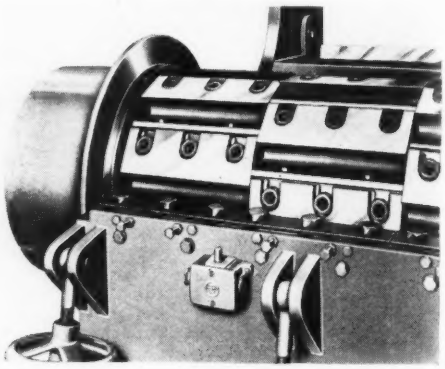
Denver, Greenville, (S. C.)

new equipment

(Continued from page 20)

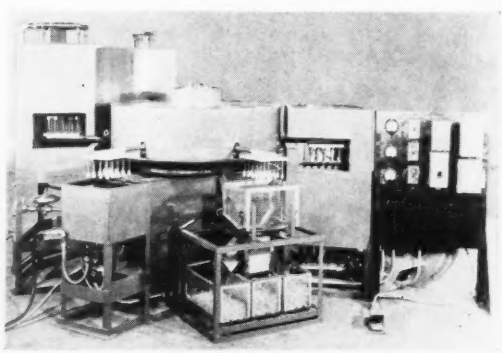


Knife mill cuts many materials

Versatile Knife Mill

Pallmann Pulverizers Co., Hoboken, N. J., has introduced a knife mill which will cut into particles plastic or synthetic material and also leather, textiles, cork, rubber, even if reinforced with fabric plies or chemical binders.

Material to be cut is fed through a chute, where a series of knives set on a rotor cuts off the material. A permanent magnet removes any iron impurities. Size of the cut product is controlled by screens inserted into the machine; the screened material may be discharged into bags or other containers.

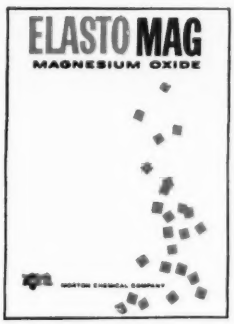


The first fully automatic diversified dipping machine has been introduced by The Akron Presform Mold Co., Cuyahoga Falls, O. The six-station machine preheats forms, dips, thermosets film, cools, strips, and sorts, completing a cycle in as little as 36 seconds, the company reports. The machine turns out dipped goods at the rate of 12,000 items an hour. Cycle-regulating gages are calibrated in seconds; so the time cycle and temperatures can be set exactly. Up to 20 forms may be mounted on each form-carrying plate, and three different items can be made simultaneously.

ELASTOMAG
MAGNESIUM OXIDE

Three activity grades give you ideal process safety for every type of recipe

Cut down on costly throw-away loss caused by scorch. Get better bin stability . . . better states of cure by using an *activity-controlled* ELASTOMAG oxide from Morton. Three precision activity grades of ELASTOMAG—170 (high), 100 (medium), and 20 (low)—let you choose the oxide with a Morton Activity Index (MAI) that's ideal for every stock. New ELASTOMAG Micro-Pellets eliminate dusting problems. No binder or treating agent is used. In the mixer, Micro-Pellets break down to minute particles . . . provide the same superior dispersion as ELASTOMAG in the powdered form.



Get new ELASTOMAG Bulletin that summarizes tests on Neoprenes, Hypalon, and Fluoroelastomers. See how you can increase production with a new ELASTOMAG oxide. Ask your Morton Man for a copy now. Phone or write distributors below.

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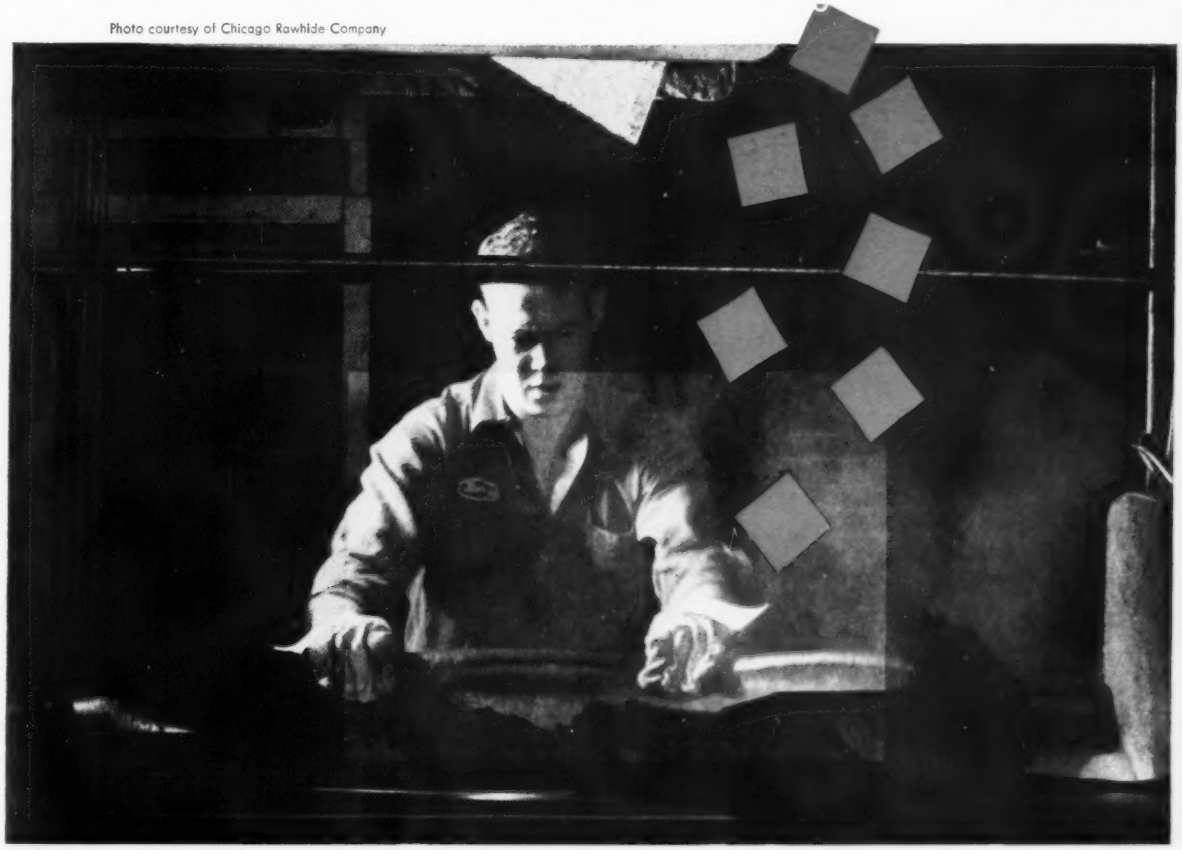
Photo courtesy of Chicago Rawhide Company



CAMBRIDGE PYROMETERS HELP SEIBERLING MAKE BETTER TIRES

Photograph courtesy of Seiberling Rubber Company

Combination and single purpose instruments.

Subjecting tires to accelerated road tests is regular procedure in quality control at Seiberling Rubber Company. Engineers must know sub-surface temperatures of tires during tests. Illustration shows a Seiberling engineer supervising the use of a Cambridge Needle Pyrometer. In addition to research, Cambridge Pyrometers are widely used in many industries for temperature determination in routine production. They are accurate, quick acting, rugged and convenient to use. Made in three models.

CAMBRIDGE NEEDLE • MOLD • ROLL PYROMETERS

CAMBRIDGE INSTRUMENT CO., INC.

1664 Graybar Bldg., 420 Lex. Ave., N.Y. 17, N.Y.

Bulletin 194-S gives details of these instruments.
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EXPORT — IMPORT
DEPENDABLE — RELIABLE

CHEMDYE RUBBER CORP.
331 MADISON AVENUE
NEW YORK 17, N.Y.
MURRAY HILL 7-3034

new equipment

Portable Water Chiller

Application Engineering Corp., Franklin Park, Ill., is now marketing the Multitem portable water chiller, which is completely self-contained, including water pump and water storage tank, ready for functioning upon connection to process. Compressor motor is equipped with high-pressure cut-out, motor circuit breaker, overload relay, and low pressurestat. A safety thermostat protects the unit from freezing.

Chilling components and all piping are insulated to prevent condensation. Centrifugal pumps with brass impellers enclosed in a cast-iron housing and drip-proof enclosed motor with sealed ball-bearings may be removed without disturbing piping connections.

New Hygrometer

Abrax Instrument Corp., Jamaica, N. Y., announces the production of its Abbeon Model No. R560 container-type hygrometer, which is used for obtaining the relative humidity of samples of grainy or powdered materials.

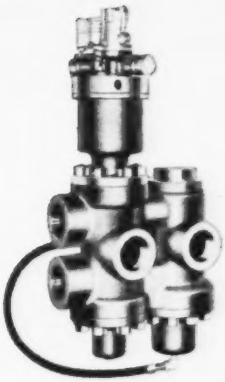
The sample to be tested is placed in an aluminum container, and the hygrometer is inserted into the top of the container and left there for about 20 minutes, at the end of which time the instrument will indicate the relative humidity of the sample. Then the percentage of moisture of the sample is determined by consulting a table of humidity equilibrium.

A new 1,000-pound-capacity portable container for carbon dioxide has been introduced by Liquid Carbonic Division of General Dynamics Corp. The unit, the Liquiflow Portable, maintains CO_2 at 300 psig., 0° F., by a self-contained refrigeration unit which operates on standard 110-volt current. It is available for use in plants to eliminate extensive piping or multiple fixed installations

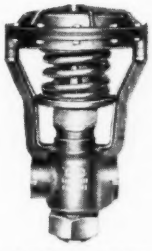
Solve your fluid control problems with

SINCLAIR-COLLINS

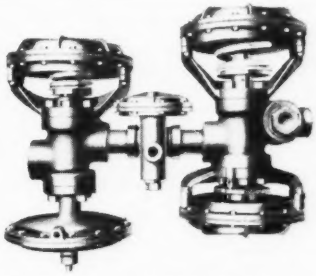
Diaphragm-Operated Valves



3,000 PSI, 4-WAY SEMI-AUTOMATIC air operated, handles oil, water, glycol-base fluids, 1 - 2 in. NPT.

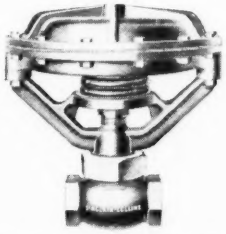


300 PSI, 3-WAY OR REVERSE ACTING bridge yoke, triple-guided stem, ¼ - 3 in. NPT.

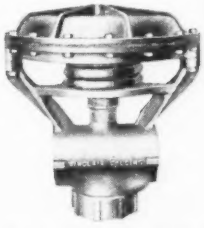


4,000 PSI, 3-WAY AUTOMATIC 2-pressure, auto-neutral, throttling, ½ - 3 in. NPT.

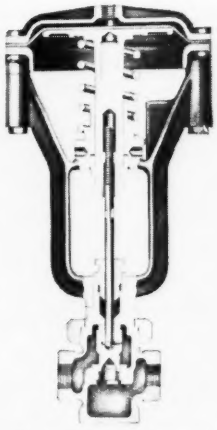
4,000 AND 6,000 PSI, 2 AND 3-WAY BALANCED NC or NO, pressure above or below seats, ½ - 2 in. NPT.



150 AND 300 PSI, DIRECT ACTING globe body, top-guided stem, ¼ - 3 in. NPT.



150 PSI, 3-WAY OR REVERSE ACTING, ¼ - 3 in. NPT VACUUM, 2-WAY, 1 - 3 in. NPT compact design, positive sealing, bridge yoke.



250 PSI, 2-WAY V-PORT MODULATING controls temperature, pressure or flow, direct or reverse acting, ½ - 2 in. NPT.

FOR HOT OR COLD RAW WATER, OIL, AIR, STEAM SERVICE
2, 3, AND 4-WAY • SINGLE OR TWO PRESSURE
HIGH OR LOW PRESSURE • AIR OPERATED
AUTOMATED OR REMOTE MANUAL CONTROL
IDEAL FOR CENTRAL RAW WATER HYDRAULIC SYSTEMS

Chances are, you'll find the answer to your control valve problems in Sinclair-Collins' line. Sound design and highest quality construction . . . Stellite stem seats, Monel stems, hardened replaceable body seats, heavy-duty bronze, ductile iron or cast steel bodies . . . these and many other features assure leak-free performance . . . resistance to corrosion . . . elimination of seat wire drawing . . . longest service life.

For application engineering recommendations, contact your nearby Sinclair-Collins field engineer.

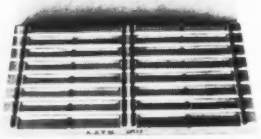
For more information, write for Bulletin SC-59. Address The Sinclair-Collins Valve Company, Akron 11, Ohio, Dept. RW-361.

The SINCLAIR-COLLINS VALVE Co.

DIVISION OF INTERNATIONAL BASIC ECONOMY CORPORATION (IBEC)
AKRON 11, OHIO

When Ordering Steel Precision Molds
SPECIFY **HOGGSON**
Designed to ASTM Standards or YOUR Specifications

D813, Fig. 3
DeMattia,
Flex Test.



ANOTHER HOGGSON MOLD
Designed for a Specific Need

D813, Fig. 3 DeMattia Flex Test was designed to answer a specific problem. Hoggson engineers are known throughout the world for reputable service in supplying manufacturers of rubber, plastic and synthetic products with precision molds and dies for test samples or actual production. Send your requirements for Hoggson's suggestions. Ask for literature.

HOGGSON & PETTIS MFG. COMPANY
141-S Brewery St., New Haven, Conn.

DPR®
DEPOLYMERIZED RUBBER

NATURAL CRUDE RUBBER IN LIQUID FORM 100% SOLIDS

AVAILABLE IN
HIGH and LOW VISCOSITIES

DPR, INCORPORATED
A Subsidiary of H. V. HARDMAN CO.
591 CORTLANDT STREET
BELLEVILLE 9, N. J.

DPR TRADE MARK

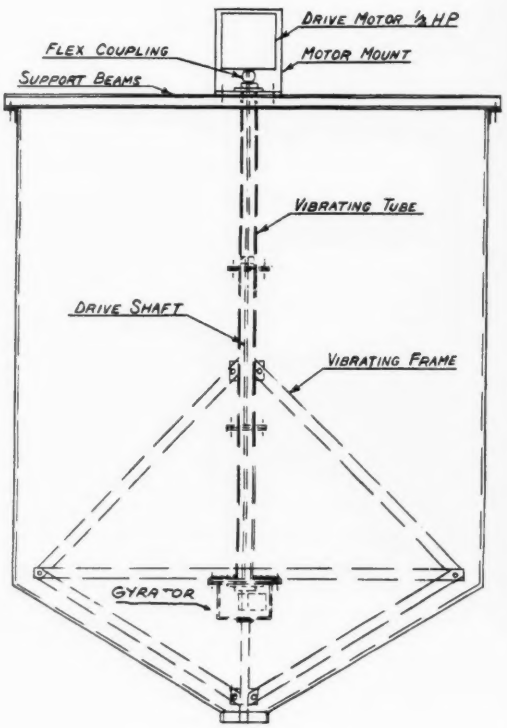
new equipment

New Vibrator

A one-cubic-foot vibrator that can be tilted for rinsing while still vibrating has been announced by Lord Chemical & Equipment Division of Wheelbrator Corp., York, Pa.

Designated the HD-1016 Vibrator, the new model is 10 inches wide, 16 inches long, and 13 inches deep, with ½-inch-thick rubber lining throughout; this vibrator contains a variable amplitude shaft, adjustable from 0-¼ inch amplitude. The frequency is variable within a range of 700 to 2,100 cycles per minute.

In combination with a punch-plate screen to fit the top of the bowl, the vibrating-while-tilted feature facilitates separation of fine or fractured chips from the rest of the material.



Vibra Screw bin activator

Storage Bin Activator

Vibra Screw Feeders, Inc., Clifton, N. J., has introduced two new types of equipment to maintain flow of materials out of storage bins. One activates the materials themselves, and the other the bin.

One device, the Vibra Screw hopper activator, imparts vibrations directly into materials by means of a vibrating shaft with attached spiders or vibrating arms, centered vertically from the base to the

(Continued on page 36)

ROEBLING WIRE, in Convenient Bulk, packaged to save you money, time and labor

If you use high-carbon wire in sizes from .060" diam. to .030" diam., it will pay you to investigate Roebling's Reel-less Core Packaging System. This method offers you substantial savings in several ways—to say nothing of the quality wire that Roebling always delivers in any kind of package.

Here's how simple it is:
Cores are palletized two cores per pallet and can be stacked two or three pallets high (think of the saving in storage space).

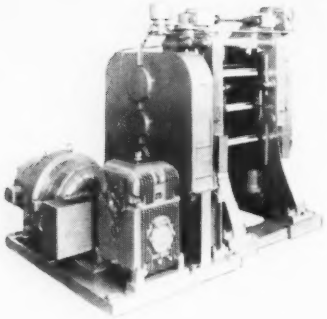
Empty reels are not accumulated because there are no reels to store, send back, bookkeep, get credit on, or pay shipping charges on (either way). Just unwrap the wire, set it up the way you see here, and there you are. Where a limited number of reel-less core packages are used, or where wire is flipped from reels mounted in a horizontal position, the tilt table is not necessary.

This method is typical, indeed, of Roebling's efforts to make quality easier to handle and to banish the problems that cost you time, money and sharp pains across the brow.

Full details of wire without reels will be immediately forthcoming when you write Roebling's, Wire and Cold Rolled Steel Products Division, Trenton 2, New Jersey.

ROEBLING

Branch Offices in Principal Cities
John A. Roebling's Sons Division • The Colorado Fuel and Iron Corporation

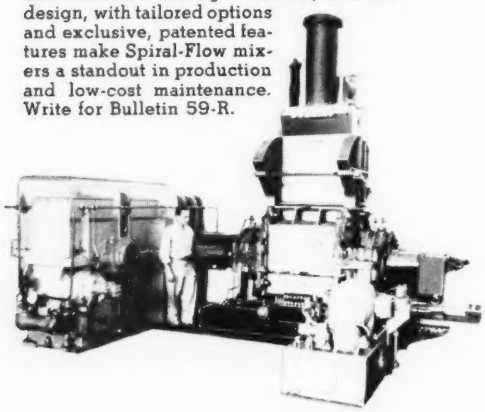


CALENDERS

Stewart Bolling calenders have long since established their worth by their dependable, rugged design, and versatility in use. Modern appearance, flexible design, and realistic cost enhance their use in any rubber manufacturing plant. 2-, 3-, and 4-roll standard and special calenders are offered, from 8″ x 16″ through 22″ x 62″. Write for catalog 58-M.

MIXERS

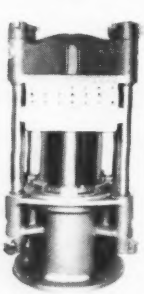
The Stewart Bolling Spiral-Flow intensive mixer line embraces a laboratory model, a lab-production size, and four production capacities, to fulfill any mixing requirement. Four types of drives can be furnished. Three kinds of discharge doors are available. Stewart Bolling's modern, seasoned design, with tailored options and exclusive, patented features make Spiral-Flow mixers a standout in production and low-cost maintenance. Write for Bulletin 59-R.

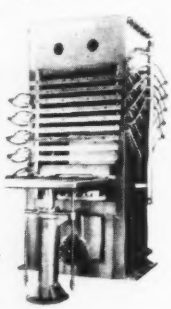


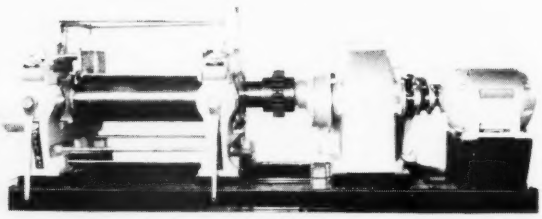
PRODUCTION and LABORATORY MACHINERY

PRESSES

Stewart Bolling compression and transfer molding presses in every usable size, in all basic types of construction, answer every practical need. Slab side presses range from 20″ x 20″ to 48″ x 48″; 150- to 1250-ton pressures. 4-bolt line from 14″ x 14″ up; pressures 50 to 2500 tons. Also full- and semi-ring high pressure 22″ x 22″ to 48″ x 48″; 500 to 2000 tons . . . Single- or multi-decked, steam or electrical heat. Massive, deflection-resisting for production with accuracy. Write for Catalog 58-P.







MILLS

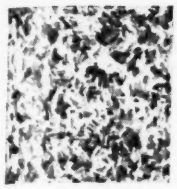
The widest range of laboratory mills is now presented by Stewart Bolling. ULTRA, deluxe and standard models start with a 2½″ dia., 7″ wide roll mill. Eleven sizes in all are topped by the 26″ dia., 100″ wide roll mill. Special requirements can be met in roll speeds, lengths and widths. Stewart Bolling also has direct-connected drives, shown above on a 60″ roll mill. All Stewart Bolling mills are described in Catalog 58-M.

Stewart Bolling
& Company, Inc.

3190 EAST 65th STREET • CLEVELAND 27, OHIO

Designers and Builders of Machinery for the Rubber and Plastics Industries

Intensive Mixers • Calenders • Mills • Refiners • Crackers • Dust Grinders • Sheeters
Hydraulic Presses • Pump Units • Accumulators • Elevators • Bale Splitters • Vulcanizers
Speed Reducers • Gears • Extruders



Build beauty and performance into your transparent rubber products with HI-SIL® 233

Use of Hi-Sil 233 as a reinforcing agent makes possible transparent rubber and vinyl stocks for production of such items as the new deep-toned simulated marble flooring, transparent sport soles, swim fins, clear tubing, pharmaceutical items, pressure-sensitive sheets and tapes.

Here's why Hi-Sil 233 is so popular with transparent rubber formulators:

- Hi-Sil 233 has a refractive index (1.46) very close to that of natural rubber and many synthetics.
- In some SBR stocks, loadings as high as 97.5 parts (50 volumes) give glass-clear transparency.
- Highly loaded stocks reinforced with Hi-Sil 233 may whiten when stretched, but regain transparency when strain is removed.
- Colored transparent stocks can be compounded also, since Hi-Sil has very low covering power.
- Stocks exhibit excellent physical properties when formulated properly with Hi-Sil 233.

You'll find full information including results of extensive testing in two technical bulletins (Hi-Sil Bulletins 15 and 21). Write for your copies and learn how Hi-Sil can improve your transparent formulations.

columbia | southern chemicals

CHEMICAL DIVISION
PITTSBURGH PLATE GLASS COMPANY
ONE GATEWAY CENTER PITTSBURGH 22, PENNSYLVANIA
DISTRICT OFFICES: Boston • Charlotte • Chicago • Cincinnati • Cleveland
Dallas • Houston • Minneapolis • New Orleans • New York • Philadelphia
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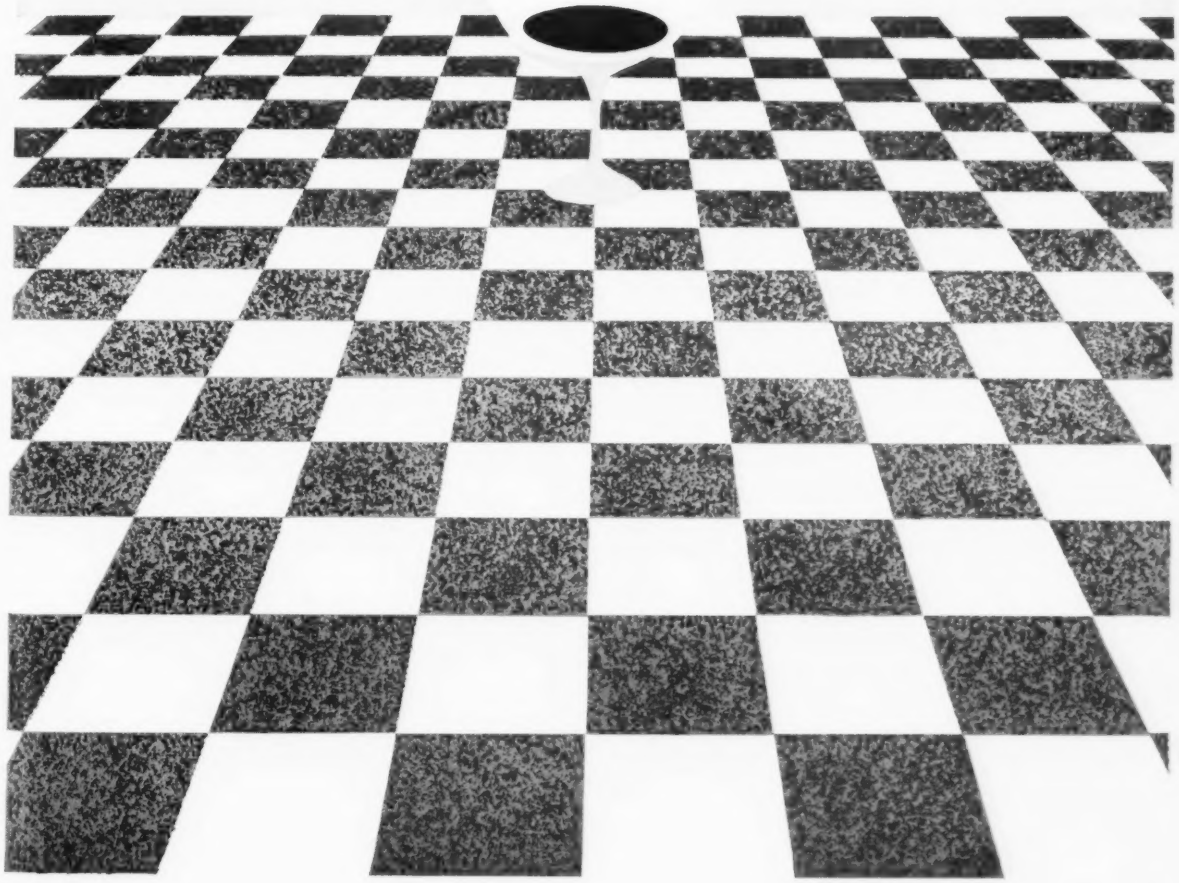
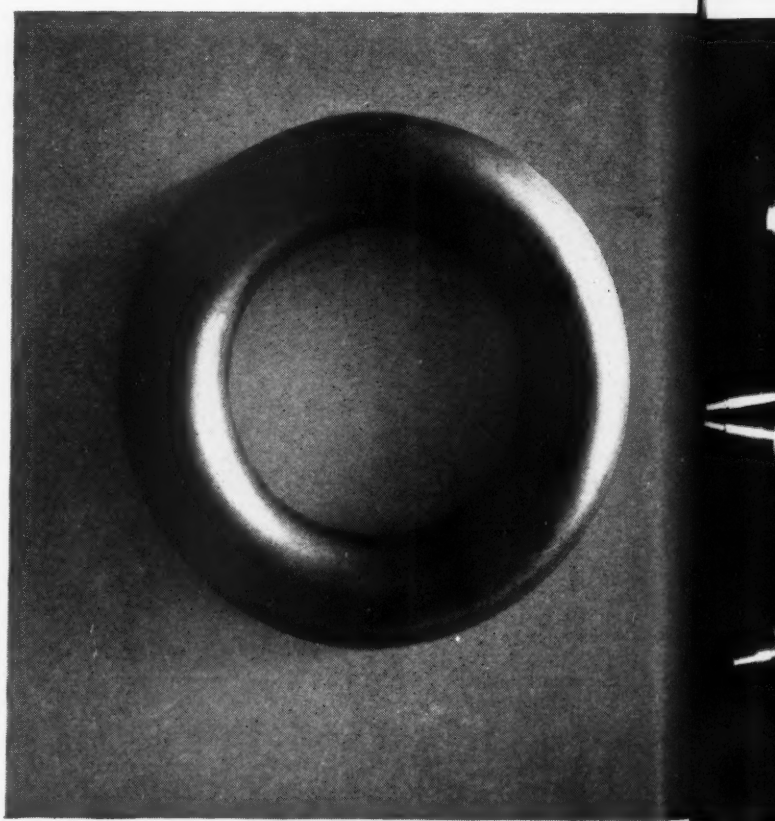


WHY POLYSULFIDE CRUDES

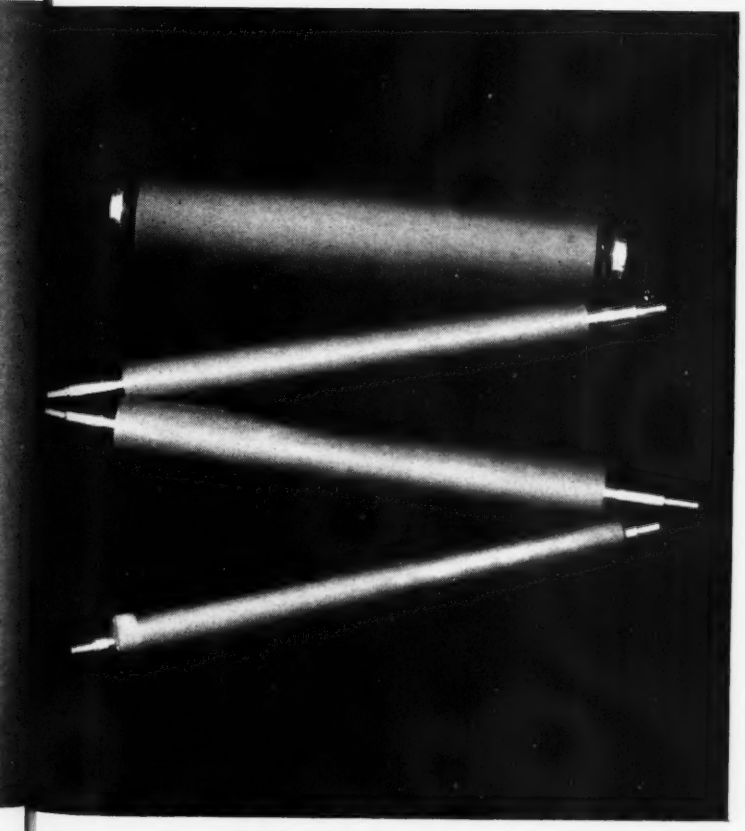
HIGH SOLVENT RESISTANCE. Industry has found no other elastomers perform so well so long under exposure to oils, aromatic fuels, chemicals, solvents and other degrading liquids as THIOKOL polysulfide crudes. Top name manufacturers of paint spray equipment, for example, have made polysulfide rubber the traditional choice for lining hose. As a carrier of paint, solvent, thinners, THIOKOL polysulfide rubber provides trouble-free service years on end.

LOW TEMPERATURE FLEXIBILITY. Though the mercury drops far below zero, polysulfide crudes stand up—without plasticizers. No brittleness. No cracking. No loss of serviceability. In demanding applications such as gaskets and O-rings in aircraft fuel systems, THIOKOL polysulfide rubber keeps its resiliency through the low temperatures of high altitudes. Rubber components, hose, sheeting can be fabricated for service at temperatures to minus 65 deg. F.



S ARE PICKED FOR THE BIG JOB

IMPERMEABILITY TO GASES. From sheets of polysulfide rubber or fabrics coated with it, manufacturers of gas meter and regulator diaphragms are producing the most reliable measuring components ever. THIOKOL polysulfide crudes maintain full integrity though constantly exposed to degrading gases, sunlight, ozone, vapors and to wear of diaphragmatic action.



LONG LIFE. Widening use on printing and coating rollers constantly subjected to solvents, thinners and physical stress underscores ability of THIOKOL polysulfide crudes to deliver long service life under severe conditions.

Thiokol offers comprehensive technical literature detailing properties and performance characteristics of polysulfide crudes. Copies of this helpful material will be mailed to you on request. Write on your letterhead, or use handy coupon.

Thiokol®
CHEMICAL CORPORATION

THIOKOL CHEMICAL CORPORATION
780 N. Clinton Ave., Trenton 7, N.J.
In Canada: Naugatuck Chemicals Division
Dominion Rubber Company, Elmira, Ontario

Gentlemen: Please send further information about following properties of polysulfide crudes: ___ High solvent resistance
___ Impermeability to gases
___ Low temperature flexibility

Name _____
Firm _____
Address _____
City _____ State _____

EAGLE-PICHER

...an important source of lead and zinc compounds for the rubber industry

Eagle-Picher offers you a comprehensive line of both lead and zinc compounds, produced with highest quality control standards to your exact specifications.

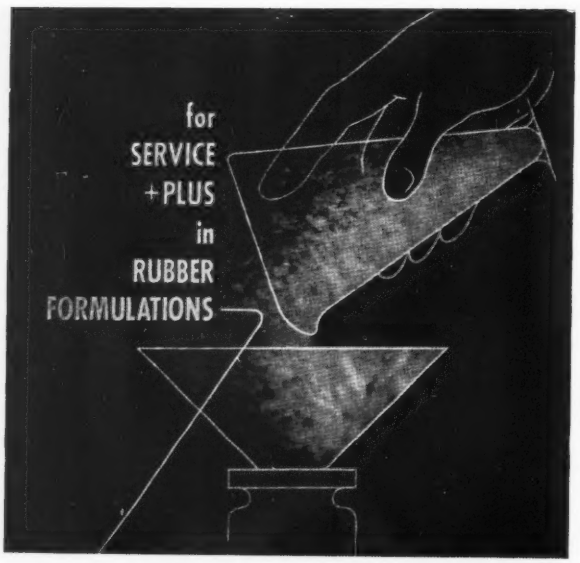
Our customer service and research staffs are geared to answer your special needs . . . with courteous dispatch and resourcefulness.

Zinc Oxides
Basic White Lead Silicate
Basic Carborate of White Lead
Sublimed White Lead
Litharge
Sublimed Litharge
Red Lead (95%-97%-98%)
Sublimed Blue Lead
Lead Peroxide

EAGLE EP PICHER

Since 1843

The Eagle-Picher Company
Department RW-361
Cincinnati 1, Ohio



Use CLAREMONT *Cotton* FLOCKS

Claremont has served the rubber industry for over thirty years as a supplier of quality flocks produced to fit specific requirements. Whether used inside or outside, as a filler or as a finish, the superiority of Claremont Cotton Flocks is recognized by all users.

Used as a compounding agent in the manufacture of mechanical rubber goods and general sundries, Claremont Flock Fillers provide reinforcement, improve tear and abrasion resistance. Claremont flock finishes for rubber fabrics provide a wide range of appealing textures that are uniform and long-wearing. In many applications the proper use of a Claremont flock will substantially reduce production costs.

Claremont's knowledge of the industry's needs and its capacity for large production and quick delivery have made it the country's foremost producer of cotton flocks. Samples will be furnished upon request for laboratory and test runs. Inquiries invited!

CLAREMONT FLOCK CORPORATION
CLAREMONT, NEW HAMPSHIRE
The Country's Largest Manufacturer of Flock

new equipment

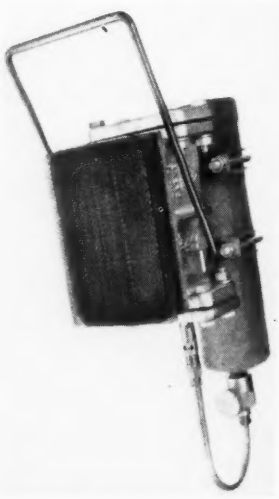
(Continued from page 30)

top of the hopper. The vibration is caused by a gyrator assembly in which revolving eccentric weights generate a gyratory movement in the nature of a vibration of about ⅛-inch.

When stored materials do not respond to the vibrations, an air cylinder on which the vibrating assembly is mounted causes the assembly to move up and down slowly through the material. The action is similar to driving a pile slowly with vibrations. The combination of vibration and vertical movement is said by the manufacturer to have solved every problem of stuck materials that the new device has been subjected to.

In the case of the device which activates the bin, the bin is suspended on resilient mounts near its top edge, and a gyrator assembly mounted outside of and near the bottom of the bin. This moves the entire bin in gyrations of about ⅛-inch.

Portable Burner



Portable gas-fired infrared burner

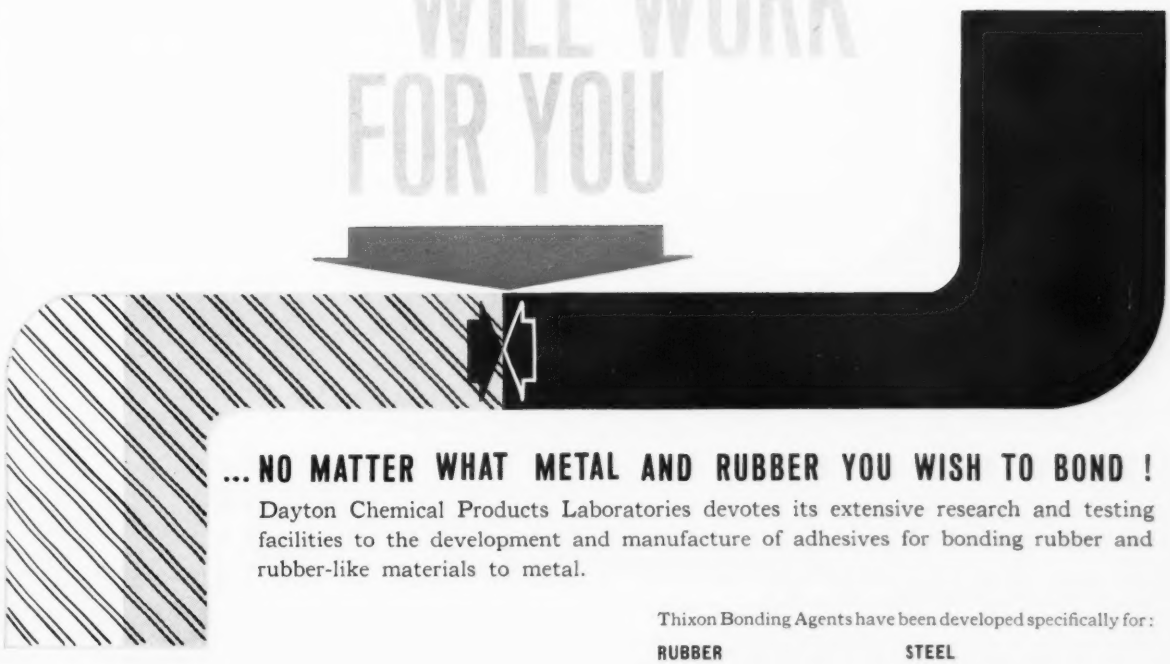
Bryant Industrial Products Corp., Cleveland, O., has announced a new portable gas-fired infrared burner for research and testing of low-temperature industrial infrared process applications. A self-contained supply of propane gas from a replaceable tank supplies the unit continuously for two hours. The portable burner has a built-in carrying handle which doubles as a foot support for bench use.

Face temperature of the four- by six-inch radiant screen can be varied from 1200 to 1800° F. Radiant heat emission is in the 2.0 to 4.0 micron band, the optimum wavelength range for maximum heat absorption by most materials. Nominal heat output is 10,000 BTU per hour.

The burner can be used for spot heating in maintenance or shop work and laboratory operations and as an experimental unit for bench testing the practical use of infrared in large-scale drying operations on textiles, metals, or porcelain enamel frit, for curing sheet molds and foundry cores, and for paint and enamel baking.

(Continued on page 46)

HERE IS WHERE THIXON WILL WORK FOR YOU



...NO MATTER WHAT METAL AND RUBBER YOU WISH TO BOND !

Dayton Chemical Products Laboratories devotes its extensive research and testing facilities to the development and manufacture of adhesives for bonding rubber and rubber-like materials to metal.

Thixon Bonding Agents have been developed specifically for:

RUBBER	STEEL
SBR	ALUMINUM
COLD SBR	BRASS
OIL EXTENDED SBR	BRONZE
NEOPRENE	ZINC
ACRYLONITRILE	COPPER
POLYURETHANE	TIN
POLYACRYLATE	LEAD
CARBOXYLIC NITRILE	SILVER
VITON	
HYPALON	
BUTYL	

If your particular application involves special stocks, metals or conditions not met by existing Thixon formulae, Dayton Chemical Products Laboratories may have the solution to your problem in new materials and formulae under consideration.

15TH YEAR OF SERVICE TO THE RUBBER INDUSTRY

DCP THIXON

Pacific Coast Distributors: C. P. Hall Co. of California, Los Angeles

Write for Complete Technical Data . . .

2555

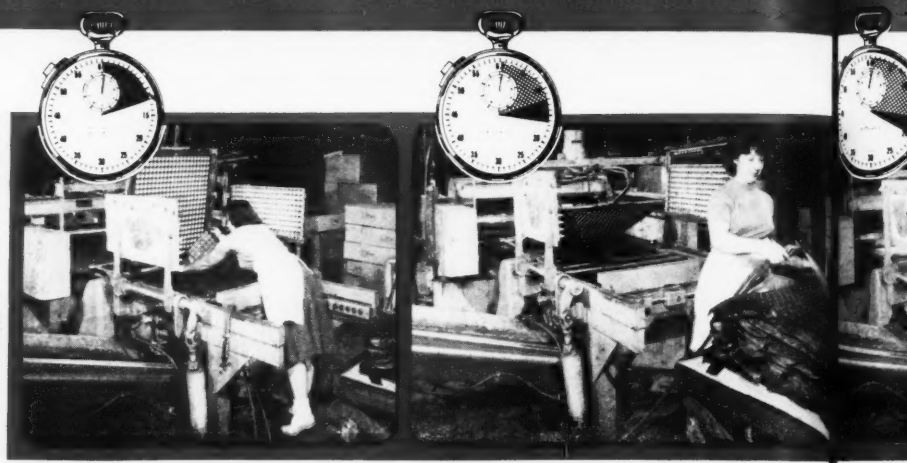
S H C HARWICK STANDARD CHEMICAL CO.

60 SOUTH SEIBERLING STREET, AKRON 5, OHIO

ALBERTVILLE, ALA. OLD GUNTERSVILLE HWY. • BOSTON 16, MASS. 661 BOYLSTON ST. • CHICAGO 25, ILLINOIS 2724 W. LAWRENCE AVE. • GREENVILLE, S.C. #1 NOTTINGHAM RD. • TRENTON 9, N.J. 2585 E. STATE ST.

PROBLEM: Monarch Rubber's big automotive customers lost to tough price competition...

ACTUAL PRODUCTION PHOTOS OF THE FEMCO ROLLER DIE CUTTER



Operator positions sheet of 400 molded rubber, automobile body plugs in horizontal die assembly. Note number and size of parts openings on vertical handler. Femco Machine takes dies from 15/16" to 3½" depth and up to 1400 lineal inches.

As next sheet is spray lubricated the die assembly moves toward roller and vertical handler descends. Femco Machines will make flash line cuts at 2 levels simultaneously. Cutting roll assembly on a new Femco Machine can move at up to 300 ft.-per-minute.

400 parts accurately trimmed in less than 20 seconds and on their way. Operator clears waste for next cycle. Scrap loss is held to a minimum because of die nesting and molded sheets are easily and quickly positioned. It is easy on the operator who handles only material to be trimmed.

Check these Results

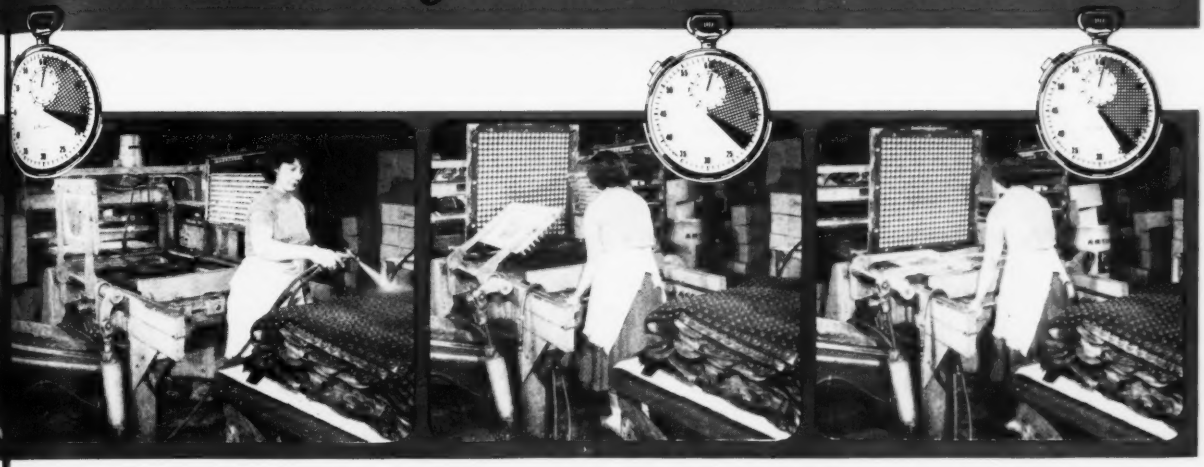
Mr. R. F. Simpson, Vice President, The Monarch Rubber Company, Hartville, Ohio reports:

1. Up to 83% reduction in cost of trimming small molded rubber parts with Femco Roller Die Cutter.
2. Up to 25% reduction in cost of trimming large parts (even rubber-to-metal).
3. Very low die costs and quick die changes when necessary.
4. Very low maintenance on dies and the Femco Machine itself.
5. Operators like the Femco Machines . . . they can make out very well on them and they are easy on the operator.
6. Automotive rubber parts are so competitive we could not compete without our Femco Machines. They are ideal for big runs.

MOVIES ARE AVAILABLE

A Femco representative will be glad to show you sound-color films of any or all types of machines made by Falls Engineering and Machine Company. Just drop us a note or call collect.

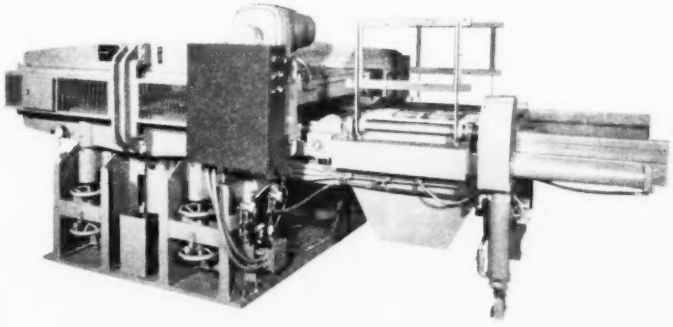
and here's how
FEMCO *Roller Die Cutters helped* MONARCH RUBBER *"bring back the business"*



Just seconds later and roller is applying line contact cutting pressure. Parts have been prepositioned by cutting plate. This type cutting insures a clean, accurate trim even on large rubber to metal parts that require intricate die shapes.

Die assembly arrives in original position as operator finishes spraying. Knock-out arms are activated to push parts through dies. In other type cuts die assembly rotates 180 degrees and parts are knocked out in reverse direction.

In this operation knock-out arms are pushing parts into bin beneath machine where a conveyor moves parts on to next production station. Note dual palm switches for greatest safety. Femco Machines stop or start at any operating stage.



Our Current Model — or Do You Want It Tailor-Made?

There are unlimited variations of the Femco Roller Die Cutter. It can be set up to suit your product line or materials. It will handle sheets, rolls, blocks, or slabs. Cuts or trims Urethane, Vinyl or Rubber foams; open or closed-cell sponge; Fibreglas, Tuflex and other types of padding or insulation; single or multiple thicknesses of plastic sheets, cloth, leather, cardboard, paper, or gasket materials and even vacuum formed plastics. The Femco Roller Die Cutter is fast, versatile and economical. It may help you solve production and cost problems. Write today for complete information.

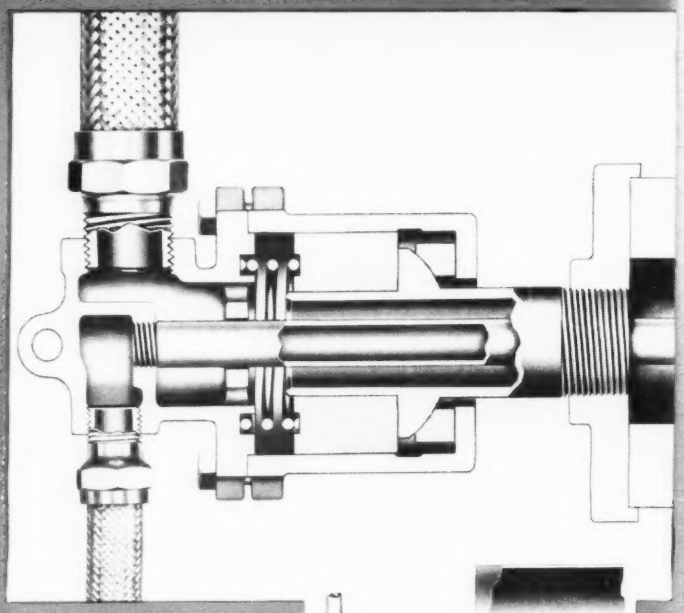
FEMCO

THE FALLS ENGINEERING & MACHINE CO.

Cuyahoga Falls, Ohio

FIRST IN THE RUBBER AND PLASTICS INDUSTRY...

JOHNSON Rotary Pressure JOINTS

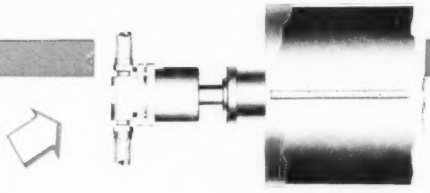


For water cooled or steam heated rolls...

For the job of getting water or steam—or both, intermittently—into mills and calenders, Johnson Joints out-number and out-perform anything of their kind. All of those you see here seal without packing, need no lubrication or adjustment, and are completely self-supporting. They take today's high speeds, pressures and temperatures right in stride—can be furnished for use with Dowtherm, Monsanto Aroclors and hot heat transfer oils up to 700°F., pressures to 250 psi. and higher.

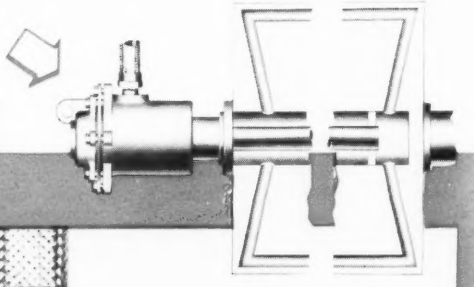
TYPE SB JOHNSON JOINT

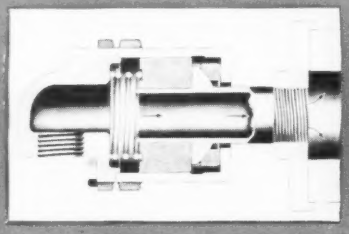
Used with stationary steam or water distribution pipe on cored rolls. See typical installation with chilled water spray pipe. Joint has only four internal parts, which means fewer breeding places for trouble and permits ready servicing right in the field.



TYPE SN JOHNSON JOINT

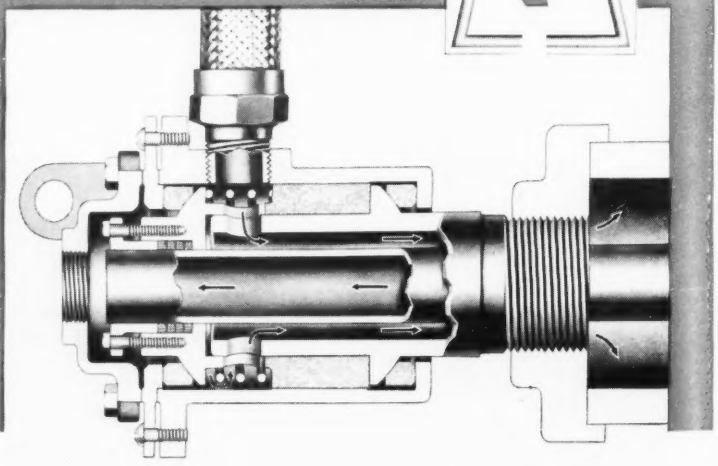
Used for rotating internal pipe applications. See typical installation on drilled roll. Assembly plate between head and body of joint facilitates mounting and inspection. The seal between rotating and stationary surfaces is still accomplished without any packing.





For Calender trains, too...

Type SA Johnson Joints are ideal for through-flow service on cooling rolls. They are compact in size, need no external supports.



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Rotary Pressure Joints • Direct Operated Solenoid Valves

COPOLYMER LATEX

COPO 2000 — A medium solids "hot" latex having a high bound styrene content which gives excellent film strength and adhesive qualities. Used in cord dipping, rug backing and other textile treating applications.

COPO 2101 — A low solids "cold" latex for general purpose use. Excellent for tire cord dip.

COPO 2102 — This high solids "cold" latex has a low bound styrene content but has the highest rubber hydrocarbon content of all cold latices in production. Used primarily in the manufacture of latex foam sponge and is especially applicable where low temperature flexibility is the governing factor.

COPO 2105 — This latex has an excellent wet gel (uncured film strength). COPO 2105 is used extensively for foam sponge, carpet backing, adhesives, and a general purpose high-strength latex.

COPO 2108 — A medium solids version of COPO 2101.

COPO 2110 — This high solids "cold" latex has excellent properties for the manufacture of foam rubber and is also recommended for backings and adhesives and as a general purpose high-strength latex.

COPO 3852 — This latex is used with very good economy for rug and textile backing, adhesives, and as a general purpose high strength latex. COPO 3852 is a medium high solids "cold" latex.

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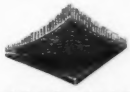
FOAM

COPO 2102
COPO 2105
COPO 2110

TEXTILE TREATING

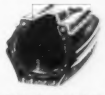
COPO 2000
COPO 2108
COPO 3852

CARPET BACKING



COPO 2105
COPO 2110
COPO 3852

TIRE CORD DIP



COPO 2000
COPO 2101
COPO 2108

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Copolymer

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RUBBER GRADE — FAST CURING TYPES

BLACK LABEL No. 20

Very fine particle size, giving maximum reinforcement and activation in rubber. For highest quality rubber goods.

RED LABEL No. 30

Excellent reinforcing and activating properties in rubber. Having fewer extremely fine particles, it is easier to incorporate than Black Label No. 20.

RUBBER GRADE — SLOW CURING TYPES

RED LABEL No. 31

Slow curing type for long flat cures and excellent scorch resistance. Good activating and reinforcing properties.

RUBBER GRADE — SURFACE TREATED TYPES

BLACK LABEL No. 20-21
GREEN LABEL No. 42-21

These grades are made from Black Label No. 20 and Green Label No. 42, respectively, by surface treating with a nontoxic hydrophobic high molecular weight organic material. They disperse in a rubber mix rapidly and thoroughly, developing physical properties, in vulcanized rubber comparable to standard Black Label No. 20 and Green Label No. 42.

LATEX GRADE

BLACK LABEL No. 20

Very fine particle size, giving minimum settling out in water dispersions and maximum activation in Latex Compounds.

GREEN LABEL No. 12

Heavily-calcined Black Label No. 20 type, containing few extremely fine particles. Less reactive than Black Label No. 20 and produces low viscosity water dispersions which do not readily thicken.

GREEN LABEL No. 43

Medium particle size for easy wetting. In pellet form this grade is particularly advantageous in preparing pourable 70% zinc oxide water dispersions.

GREEN LABEL No. 42

General purpose type. Excellent activating and moderate reinforcing properties. Faster rate of incorporation into rubber than Black Label No. 20 or Red Label No. 30.

GREEN LABEL No. 43

Large particle size type for easy incorporation. Good activating and reinforcing properties.

GREEN LABEL No. 42A-3

Somewhat larger in particle size than Red Label No. 31 for easier incorporation; otherwise, similar in general characteristics.

GREEN LABEL No. 46

Low pH type used in foam latex where zinc oxide is used for both activation and as a supplementary gelling agent.

RED LABEL No. 30

Intermediate particle size, having fewer extremely fine particles than Black Label No. 20. Less reactive than Black Label No. 20, producing lower viscosity water dispersions which do not readily thicken.

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are factors . . . .
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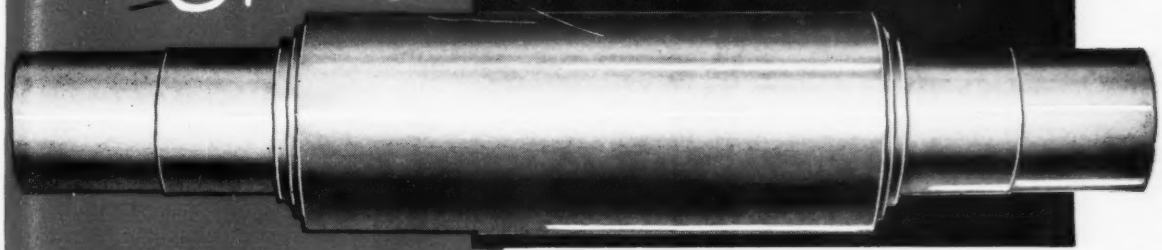
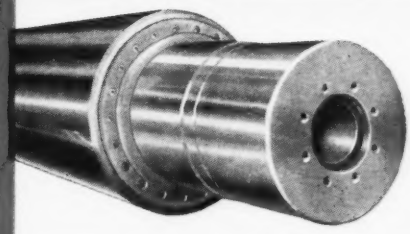
DRILLED-TYPE ROLLS





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MAINTAIN A UNIFORM ROLL SURFACE TEMPERATURE throughout, with minimum deviation at any point.

ASSURE FULL RANGE HEATING and cooling over wide temperature ranges.

PROVIDE ACCURATE, QUICKLY RESPONSIVE TEMPERATURE CONTROL.

UTILIZE FULL ROLL FACE with new, ring closure type designs.

PERMIT ADJUSTMENT OF RING CLOSURE GASKET AND BOLTS, WITH ROLL IN PLACE in calender or mill, thus eliminating production downtime due to roll removal.

MAINTAIN CORRECT DEPTH OF CHILL for iron or alloy iron rolls.

ARE ENGINEERED AND DESIGNED FOR MAXIMUM HEAT TRANSFER RATE with accurately drilled, fluid passages.

Our more than 50 years experience in the design and manufacture of rolls can be helpful in solving your processing problems. Your inquiry is solicited.

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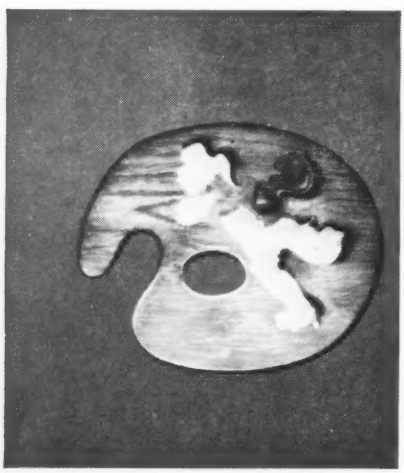
IS TOPS IN ALL-'ROUND

RESISTANCE TO CHEMICALS

Enjay Butyl, because of its unique and extremely low degree of unsaturation, offers excellent resistance to corrosive chemicals. The preferred rubber for tank linings, hose, seals, gaskets and other applications where exacting chemical resistance is required.



VIVID COLORS

Enjay Butyl requires no additives for quality coloring over a wide range of hues. Famous for colorability and smooth finishes, Butyl has been successfully plastic coated for special applications.

RESISTANCE TO TEAR AND ABRASION

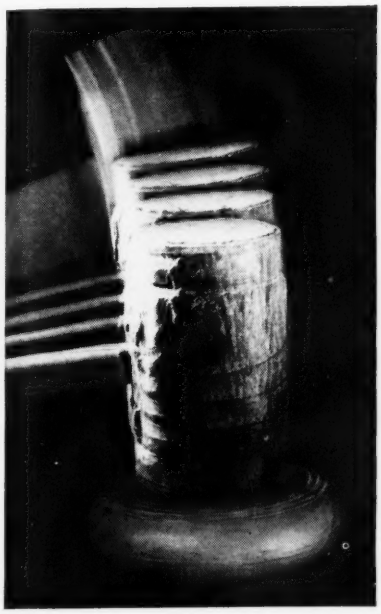
Enjay Butyl offers the highest aged tear strength of any rubber . . . even after long exposure to ozone and heat! Its inherent toughness resists abrasive wear, in such applications as tires, conveyer belts, hose and other mechanical goods.

RESISTANCE TO SUN-LIGHT AND WEATHERING

Enjay Butyl has proven its resistance to ultra-violet light, ozone, oxidation, moisture and mildew. Increases life of products such as weatherstrips, garden hose, wading pools and automotive parts.

RUBBER

PERFORMANCE



DAMPING PROPERTIES

Enjay Butyl absorbs shock and vibrational energy more completely than any other rubber. Resiliency can be varied in compounding and processing. Butyl is ideal for axle and body bumpers, motor mounts and sound-deadening applications.

IMPERMEABILITY TO GASES AND MOISTURE

Enjay Butyl is tops in impermeability to gases and moisture . . . retains air pressure 8 times better than natural rubber. Outperforms other rubbers in such application as inner tubes, jar and bottle seals, hoses and inflatable goods.

ELECTRICAL RESISTANCE

Enjay Butyl tops all vulcanizable rubbers in electrical and dielectric properties . . . in resistance to corona and ozone breakdown and water absorption. Its high dielectric strength insures against electric breakdown under normal or surge voltage. Its heat resistance permits higher current flow for a given conductor size.

EASY PROCESSING

Enjay Butyl Rubber is a copolymer of isobutylene with a small proportion of isoprene to give it a controlled, low degree of unsaturation. Processing is similar to that of natural rubber except no premastication is required.

The outstanding properties of Butyl Rubber create new horizons for the designer, and offer to manufacturers an opportunity to utilize the qualities of rubber in applications never before possible. The unique properties of Butyl have led to vast improvement in many existing products. Technical skills will open the way to countless new uses.

Butyl is the "idea" rubber with uses stretching as far as the imagination can reach. We'll be glad to tell you all about it. Just contact Enjay at 15 West 51st Street, New York 19, New York.

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ENJAY CHEMICAL COMPANY

A DIVISION OF HUMBLE OIL & REFINING COMPANY

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Now... PRECISION MOLDING
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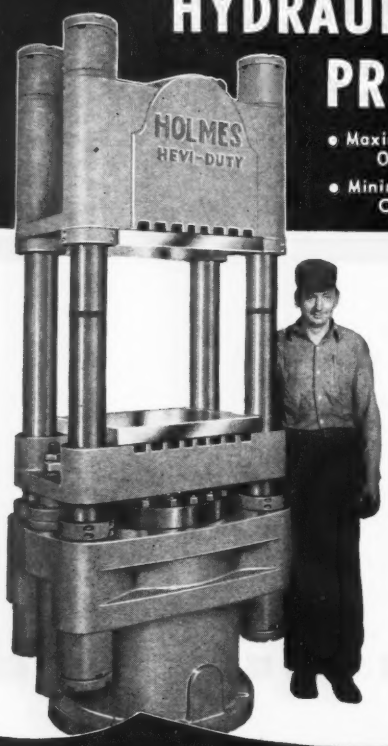

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The new and improved Holmes Hydraulic Press retains all the features of its famous predecessors... PLUS...many outstanding improvements. These put it in a class by itself--for all kinds of general purpose work...and...special production where close tolerance is required. Low in price. Practically no maintenance. Will quickly pay for itself in any processing plant.

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Stanley H. HOLMES Company
Successor to Holmes Brothers, Inc.
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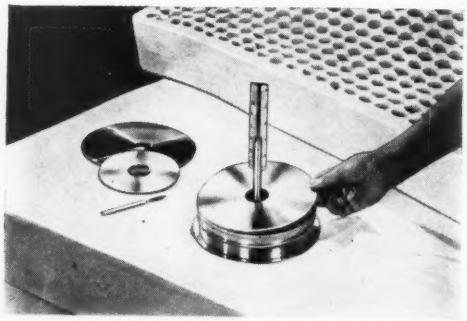
new equipment

(Continued from page 36)



Wohler foam tester

Foam Tester

A portable instrument for determining the indentation compression or firmness of rubber latex, urethane and vinyl foams, curled hair, and other flexible cushioning materials has been introduced by Testing Machines, Inc., Mineola, N. Y.

An entirely new and patented principle is incorporated in the Wohler foam tester enabling tests to be made through a tiny, non-damaging slit in the foam sample. Results are obtained in regulation ASTM, RMA, and SPI units.

Originally designed for testing the compression of latex rubber foam having standard cored construction, this instrument has proved to be equally well suited for testing flexible urethane foams in either slab or cored form. The low friction between metal and urethane foam, as contrasted to rubber, allows relatively free movement of the mechanism through the foam, making possible accurate indentation compression readings.

■

New Publications

(Continued from page 10)

"Processing Shell Isoprene Rubber." Technical Bulletin SC: 60-168. Shell Chemical Co., Torrance, Calif. 4 pages.

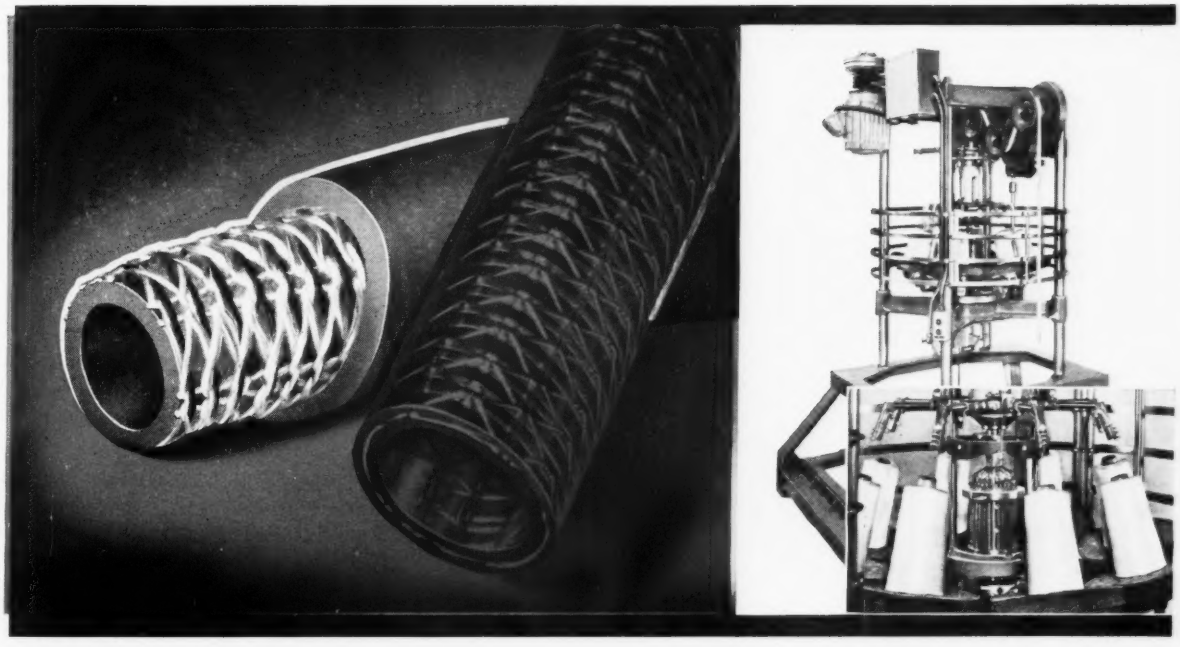
"Buell-Norblo Dust Collection and Recovery Systems." Buell Engineering Co., New York, N. Y. 4 pages.

"Neptune Stainless Steel Liquid Meters." Form 9A/10-1. Neptune Meter Co., New York, N. Y. 4 pages.

"Hammer Mills and Pulverizers." Catalog 49-A. The Young Machinery Co., Inc., Muncy, Pa. 8 pages.

"35 Ways To Reduce Your Shipping Costs." Institute for Business Research, Inc., New York, N. Y. 16 pages. $1.

IF YOU WANT TO SAVE UP TO 35% ON YARN AND ACHIEVE MAXIMUM BURST PROTECTION AT PRODUCTION SPEEDS UP TO 1,000 FEET EVERY HOUR . . . YOU'LL WANT TO KNOW ALL ABOUT THE NEW **FIDELITY** WRAP-KNIT METHOD OF HOSE REINFORCEMENT



You can do it only with the Fidelity Hose Reinforcement Knitter . . . with all natural or synthetic yarns . . . on rubber or plastic hose extrusions . . . from ⅛″ to 3″ I.D. Load 64 lbs. of yarn at one time . . . complete up to a full day's production without reloading.

No other method of reinforcement offers the circumferential strength, resistance to swell and kinking—and production economy—as Fidelity Wrap-Knit. Write for details today . . . or come see a Fidelity in action!

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It will have over 600 pages of editorial content, with authoritative descriptions for each type of material or ingredient. Names and addresses of all suppliers are included. A partial list of contents follows:

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Part Two—LATEX COMPOUNDING INGREDIENTS

Part Three—NATURAL AND SYNTHETIC RUBBERS, LATICES, AND RECLAIMS

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- Low Ammonia H & C Centrifuged (ASTM Type III)
- Deammoniated Centrifuged — Prevulcanized Centrifuged

SBR AND NBR LATICES FROM GOODYEAR'S CHEMICAL DIVISION

SBR

Pliolites	2000	2105	140
	2001	5350	151
	5300	5352	160
	5301	5353	170
	440 x	460 x	176

NBR

Chemigums	235 CHS	246
	236	247
	245 B	248
	245 CHS	520 x

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- Types 400, 571, 572, 842 A

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- Plastized and unplasticized

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- Color Dispersions
- Conductive Carbon Black Dispersions
- Curing Dispersions
- Resin Emulsions
- Sulfur Dispersions
- Surfactant (anionic)
- Thickeners (polyacrylate type)
- Wax Emulsions
- Zinc Oxide Dispersions

Take advantage of thirty years of latex technology. Contact our main office at Cambridge 39, Massachusetts or our branch plants in Ashland, Ohio; Charlotte, N. C.; Dalton, Georgia; Brampton, Ontario, Canada; and Verdun, Montreal, Canada.

GENERAL LATEX AND CHEMICAL CORPORATION
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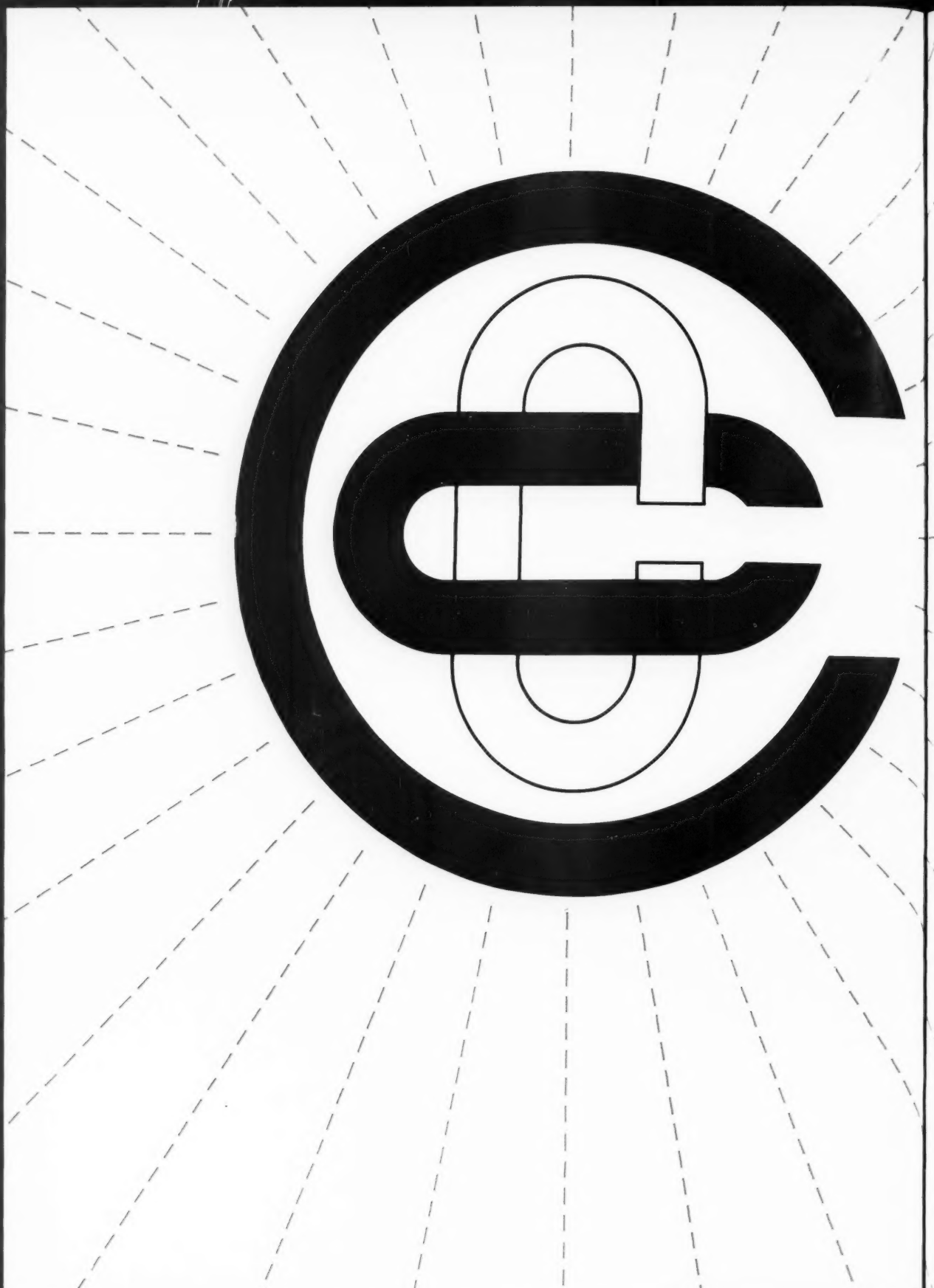

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COLUMBIAN CARBON COMPANY
International . . .
COLUMBIAN CARBON INTERNATIONAL, INC.

APRIL, 1958
Companhia Petroquimica Brasileira (Copebras)
Commercial production begins in Brazil.

JUNE, 1960
Continental-Columbian Carbon Nederland N. V.
Commercial production begins in the Netherlands.

OCTOBER, 196
Columcarb AG
European Sales and Tec cal Service office open Zug, Switzerland.

DE
Colu
Colum and T bring offices

Now...a new symbol of COLUMBIAN CARBON COMPANY on the move...around the world

Around the world, Columbian Carbon Company is more than ever on the move. And Columbian's new trademark is the mark of leadership! Wherever you are . . . whatever your needs . . . there is a Columbian representative near you . . . equipped to handle your toughest production or supply problem. Call him . . . today!

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Columbian has long been the industry leader in research. In the quest for blacks that meet the most exacting requirements, Columbian was the first to discover the importance of pH in curing characteristics... first to use electron microscopy to measure particle size . . . first to develop a dispersant free Black Rubber process. And Columbian *continues* to spearhead the research that means better, more versatile, more economical rubber products.

OUTSTANDING PRODUCTION

Product performance is the proof that Columbian has the precise production controls that deliver blacks to match your most rigid requirements. Columbian is going literally around the world to meet the demand for carbon blacks with unexcelled performance.

OUTSTANDING TECHNICAL SERVICE

Columbian is noted for Technical Service. It's always available to you . . . to analyze any aspect of your production . . . offer practicable ideas for greater economy and efficiency. Contact your Columbian representative for information about the Technical Service Laboratory nearest you.

DECEMBER, 1960

Columbian Carbon Italiana S.p.A.

Columbian opens another overseas Sales and Technical Service office in Milan, Italy bringing the total to seven overseas sales offices and agents in 40 countries.

MARCH, 1961

Columbian Continental Europa S.p.A.

Commercial production begins in Milan, Italy.

MARCH, 1961

Mitsubishi Chemical Industries, Ltd.

Commercial production begins under license from Columbian Carbon Company.

SPRING, 1961

Columbian Carbon Company

New Carbon Black Dispersions Plant begins production in Deer Park, Texas.

SUMMER, 196

Columbian Carbo (Canada) Ltd.

Commercial production gins in Hamilton, Ont Canada.

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In cooking, correct proportioning, mixing and blending are essential to every dish – particularly mulligan stew "Baldwin style."

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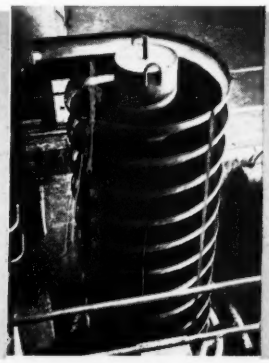
MULLIGAN OR MASTERBATCH



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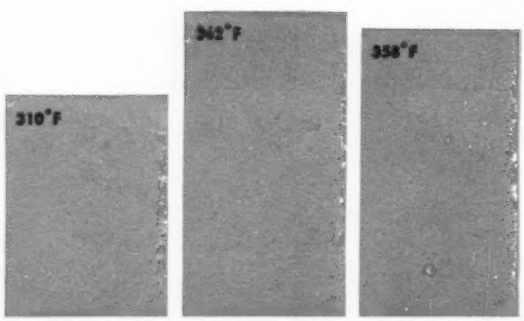

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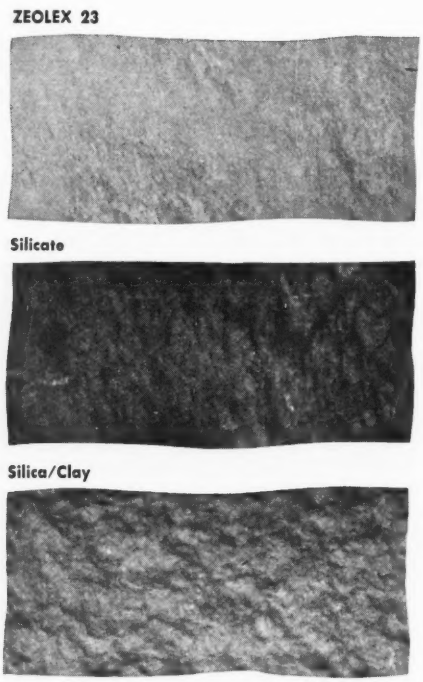

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Stereo Rubbers Are New and Different And Should Be Treated as Such in Trials

As pointed out previously, and as featured in RUBBER WORLD last month, the stereo regular rubbers are rapidly becoming more than just a laboratory curiosity and are reaching the age of production maturity.

Each producer, as facilities go on stream or near completion, sends out samples for evaluation and possible incorporation into rubber products. It would seem desirable, therefore, to try to collect some idea of what may be expected from these new materials particularly with regard to handling, mixing, and compounding problems.

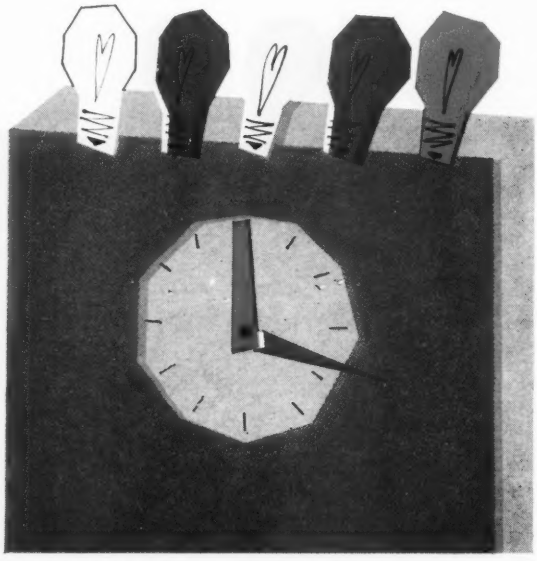
Those rubbers derived from isoprene are described as *cis*-polyisoprene, and those from butadiene as *cis*-polybutadiene. This classification is very generalized, however, and one must realize that there is great variation in the offerings from supplier to supplier, depending on catalyst, *cis* content, and process. Each rubber should be evaluated individually to develop its best properties, using the suppliers' suggested compounding techniques. It would be wise to be sure that you have the latest information since the suppliers are learning new facts almost daily and revise recommendations as new data are collected.

As a group, these rubbers are subject to considerable cold flow in the raw gum state. An uncontained sample left lying on a bench may spread out into a sticky, dripping puddle in a relatively quite short time. Successful packaging methods are being worked out by manufacturers, but in plant, handling will require certain precautionary measures.

While these materials fall within the classification of rubbers, it is suggested by many who have tried them that, at least in initial trials, they be considered compounding ingredients and added to another rubber to obtain the properties that are offered by the stereo rubber. When mixed alone, many of these rubbers are difficult to mix, may not accept well even some common ingredients, or may present difficulties in processing steps of extrusion or molding that make final property evaluation somewhat unsatisfactory.

R. S. Walker

EDITOR



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RUBBER WORLD

One Cause of

Poor Pigment Dispersion in Rubber

Adding acidic and basic ingredients together, such as stearic acid and zinc oxide, is shown to be a possible cause of formation of agglomerates

By C. A. CARLTON
J. M. Huber Corp., Borger, Tex.

POOR dispersion of pigments in rubber compounds has been a troublesome problem since the beginning of the rubber industry. An example of this kind of difficulty is the presence of white pigment lumps in black or dark-colored compounds that are surface buffed, such as some types of shoe soling.

Chemical analyses of pigment agglomerates removed from a large number of unvulcanized and vulcanized rubber compounds revealed the fact that in practically every instance a substantial amount of zinc oxide was present. This is of major importance since good dispersion of zinc oxide is necessary for the proper vulcanization of a rubber compound.

It is quite difficult to identify positively the specific variable or variables in any one given formulation which may cause pigment agglomerates. They may be due to composition of one or more of the ingredients present in the mix, the order in which the ingredients are added, or to the mixing procedure used.

However, a series of tests indicated one major cause, the addition of acidic materials such as fatty acids, organic acid vulcanization retarders, or acidic accelerators to natural rubber or some synthetic rubbers simultaneously with basic activators such as lime, litharge, magnesia, and zinc oxide, or with some basic pigments such as finely divided calcium and magnesium carbonates.

High-temperature mixing (about 325° F.) gave better dispersion than low-temperature mixing (about 220° F.) when acidic or basic materials were added simultaneously, but in some instances poor dispersion resulted even at temperatures up to 325° F. This was particularly true of litharge and magnesia.

It was also found that when zinc oxide and stearic acid were added to synthetic rubber at the same time, dispersion was better in some types of rubber than in others. The stiffer mixes of NBR (nitrile) and cold, unpigmented SBR gave better dispersion than those of the softer IIR (butyl) and-oil extended SBR.

Regardless of the type of rubber being used, the safest procedure to insure satisfactory dispersion of inorganic oxides is to add any acidic materials separately during the mixing procedure. This approach is particularly necessary if the mix contains resin acids and/or organic acid vulcanization retarders such as benzoic or salicylic acids.

If it is not feasible to add the acidic and basic compounding materials separately to the rubber, then the inorganic oxides should be added to the mix in the form of masterbatches.

Mixing Procedure and Dispersion

A natural rubber compound which was known to produce poor dispersion under certain mixing conditions was chosen for a study of the effect of the order of addition of various ingredients in dispersion. The test recipe and mill batch used are shown in Table 1.

Mixing was done on a standard 6- by 12-inch mill using a mill roll inlet water temperature of 70° C. (158° F.). Pigments were added two minutes after the start of the mixing cycle. The total mixing cycle varied from 8 to 19 minutes, depending on the ingredients added. (Table 2 gives the composition of the various mixes.)

When the zinc oxide and stearic acid were added

Table 1. Compound for Testing Ingredient Order of Addition

	Test Recipe, Parts	Mill Batch, Gms.
Pale crepe (premasticated)	100	400
Zeolex 23*	25	100
Suprex clay†	25	100
Zinc oxide‡	5	20
Stearic acid	2	8
Process oil (paraffinic)§	5	20
	162	648

* Sodium silico-aluminate, J. M. Huber Corp., New York 17, N. Y.
† Hard china clay, J. M. Huber Corp.
‡ Protox 166, New Jersey Zinc Co., New York 38, N. Y.
§ Faxam 40, Carter Oil Co. Division, Humble Oil & Refining Co., Houston, Tex.

Table 2. Composition of Mill Batches, Gms.

Recipe	Rubber	Zeolex	Suprex	Zinc Oxide	Stearic Acid	Faxam
A	400	100	—	—	—	—
B	400	—	100	—	—	—
C	400	100	100	—	—	—
D	400	—	—	20	8	—
E	400	100	—	20	8	—
F	400	—	100	20	8	—
G	400	100	—	—	—	20
H	400	—	100	—	—	20
I	400	100	100	20	8	—

Table 3. Order of Addition of Ingredients and Dispersion Ratings

Compound and Batch Number	Order of Addition of Ingredients	Dispersion Ratings*
A-1	Zeolex 23	S
B-2	Suprex	S
C-3	Zeolex 23, first; Suprex, second	S
C-4	Suprex, first; Zeolex 23, second	S
C-5	Zeolex 23 and Suprex blended together	S
D-6	Zinc oxide, first; stearic acid, second	S
D-7	Stearic acid, first; zinc oxide, second	S
D-8	Zinc oxide and stearic acid blended together	P
E-9	Zeolex 23, first; zinc oxide and stearic acid together, second	P
E-10	Zinc oxide and stearic acid together, first; Zeolex 23, second	P†
E-11	Zinc oxide, stearic acid, and Zeolex 23 blended together	F
F-12	Suprex, first; zinc oxide and stearic acid together, second	P
F-13	Zinc oxide and stearic acid together, first; Suprex, second	P
F-14	Zinc oxide, stearic acid, and Suprex blended together	F
G-15	Zeolex 23 and Faxam together	S
H-16	Suprex and Faxam together	S
I-17	Zeolex 23, first; zinc oxide and stearic acid, second; Suprex, third	F
I-18	Suprex, first; zinc oxide and stearic acid, second; Zeolex 23, third	F
I-19	Zeolex 23, first; Suprex, second; zinc oxide and stearic acid, third	F

* S = Satisfactory; P = Poor; F = Fair.
† Better than D-8 and E-9.

separately, good dispersion was obtained, regardless of which was added first. Whenever the two materials were added together, however, either in the presence or absence of other pigments, poor dispersion resulted in almost all cases. When they were blended together with either Zeolex 23 or Suprex clay, the dispersion was better than when they were added simultaneously in the absence of other pigments, but the dispersion was still unsatisfactory (Table 3).

Banbury mixing of compounds D-6, D-7, and D-8 (Table 3) gave the same results as milled mixed batches. The mixing conditions and procedures are shown below. A size B laboratory Banbury was used; the batch consisted of 900 grams of rubber; and the starting temperature was 125° F.

Banbury Mixing Conditions and Procedure

Cycle Time, Min.	Rotor Speed	Cooling Water Gals./ Min.	Procedure
0	1 (front, 80 rpm. back, 71 rpm.)	6	Add rubber
2	1	6	Add ZnO and test materials
8	1	6	Dump at 218° F.

Materials and ZnO Dispersion

Since the test showed that zinc oxide dispersed poorly when added with stearic acid, other acidic, basic, and neutral materials were studied for their effect on zinc oxide dispersion, using a Banbury mixing procedure which has been previously discussed. Table 4 gives the test recipe.

Table 4. Base Compound and Mixing Procedure for Tests of Acid to Basic Materials With Zinc Oxide

Base Compound	
Pale crepe (premasticated)	100
Zinc oxide (Protox 166)	5
Test Material	See Table 5

Acidic materials were the major cause of poor dispersion of zinc oxide. In the presence of benzoic acid, the dispersion of zinc oxide was very poor, which might be due to the fact that zinc benzoate melts at 267° C. (512° F.), well above any normal mixing temperature. Mercaptobenzothiazole (MBT) was also a cause of poor dispersion of zinc oxide; whereas benzothiazyl disulfide (MBTS) gave a satisfactory dispersion. The only acidic material which gave a satisfactory dispersion of zinc oxide was oleic acid, which was probably because zinc oleate melts at 70° C. (158° F.). (See Table 5.)

In a modification of the Banbury mixing procedure, the zinc oxide and stearic acid were added along with the rubber at the start of the mixing cycle. Although the

TABLE 5. EFFECT OF ACID TO BASIC MATERIALS ON DISPERSION OF ZINC OXIDE

Material	Type	PHR	Dispersion Rating
Aktone	Neutral	1.0	S*
Antioxidant 2246	Neutral	1.0	S
Benzoic acid	Acidic	1.0	VP†
Carbowax 6000	Neutral	2.0	S
Cumar MH 2½	Neutral	10.0	S
DOTG (Diotolyguanidine)	Basic	1.0	S
Elastopar	Neutral	1.0	S
Esen	Neutral	1.0	S
Laurex	Neutral	2.0	S
MBT (mercaptobenzothiazole)	Acidic	1.0	P
MBTS (benzothiazyl disulfide)	Neutral	1.0	S
MBTS-Aktone (1:1)	Neutral	1.0	S*
MBTS-DOTG (1:1)	Basic	1.0	S
Natac	Acidic	5.0	VP
Neozone D	Neutral	1.5	S
NOBS Special	Neutral	1.0	S
Octamine	Basic	1.0	S
Oleic acid	Acidic	2.0	S
Polymel DX	Neutral	10.0	S
Retarder PD	Neutral	1.0	F
Retarder W	Acidic	1.0	VP
Santocure	Neutral	1.0	S
Sodium acetate	Basic	1.0	S
Staybelite resin	Acidic	5.0	VP‡
Stearic acid	Acidic	2.0	P
Thionex	Neutral	1.0	S
Turgum S	Acidic	5.0	VP
Vultrol	Neutral	1.0	S

* Dumped at 240° F. to insure melting of Aktone.
† VP = Very poor.
‡ Agglomerates large and hard.

dispersion of the zinc oxide was improved, it was still far from satisfactory.

Dispersion of Other Basic Activators

Other basic activators were then tested for their degree of dispersion in the presence of acidic materials. This time five phr. of each of the basic materials were used in place of zinc oxide, but the Banbury mixing conditions and procedure were the same.

The dispersion of calcium carbonates, red iron oxide, titanium dioxide, and Zeolex 23 was not affected by the presence of the acids; in fact, both benzoic and stearic acid aided the dispersion of the Zeolex 23. The dispersion of aluminum hydrate, however, was affected by benzoic, but not by stearic acid. Except for a few instances, the dispersion of lime, litharge, and all brands of magnesia and zinc oxide ranged from poor to very poor. In all these cases the materials that had been added were found to be caked on the Banbury rotors and the shell, making it necessary to clean the machine prior to mixing the next batch.

Higher Mixing Temperatures

In order to determine the effect of higher mixing temperatures on the dispersion of basic activators and stearic acid together, the Banbury mixing procedure given below was used with a dump temperature of about

TABLE 6. EFFECT OF ACIDIC MATERIALS ON DISPERSION OF BASIC ACTIVATORS

Basic Material	No Acid	Benzoic Acid*	Stearic Acid*	Oleic Acid*
Aluminum hydrate	S	F	S	—
Atomite	S	S	—	—
Calcene CO	S	S	—	—
Lime	S	P	VP	P
Litharge	S	VP	VP	P
Maglite D	F	F	VP	VP
Maglite K	—	—	P	—
Maglite L	—	—	VP	—
Maglite M	—	—	VP	—
Maglite Y	—	—	VP	—
Magnesium carbonate	F	F	F	—
Marinco GL	—	—	S	—
Red iron oxide	S	S	S	—
Super Multifex	F	S	—	—
Titanium dioxide	S	S	S	—
Zeolex 23	F	S	S	—
Zinc carbonate	S	S	P	—
Zinc oxide No. 1	—	VP	P	—
Zinc oxide No. 2	—	VP	F	—
Zinc oxide No. 3	—	VP	P	—
Zinc oxide No. 4	—	VP	P	—
Zinc oxide No. 5	—	VP	P	—
Zinc oxide No. 6	—	P	P	—

* One phr. benzoic acid; 2 phr. oleic and stearic acids used.

325° F., which was chosen to approximate temperatures reached in production-size equipment.

HIGH-TEMPERATURE BANBURY MIXING PROCEDURE

Cycle Time, Min.	Rotor Speed No.	Cooling Water, Gals./Min.	Procedure
0	1	1	Add rubber
2	1	1	Add basic and acidic materials
As indicated	3 (front 160 rpm. back, 142 rpm.)	None	Dump at 325° F.

The batches used were made up of 900 grams of premasticated pale crepe, 45 grams of basic materials, and 18 grams of fatty acid, corresponding to a recipe of 100 parts of rubber, five phr. of basic ingredient, and two phr. of fatty acid, which were all of reagent grade unless otherwise noted.

A mixture of magnesium oxide (Maglite D) and stearic acid gave very poor dispersion in natural rubber under the test condition used, in spite of the fact that magnesium stearate is supposed to melt at 88.5° C. (191° F.). Double pressed stearic acid is a mixture of approximately 50% palmitic, 40% stearic, and 10% oleic acids. Since magnesium palmitiate melts at 121.5° C. (251° F.), it may be that the melting point of the mixture of magnesium palmitiate, stearate, and oleate is above 103° C. (218° F.), which is the average dump temperature of the mixes (Table 6).

In most cases when poor dispersion was obtained, the Banbury rotors and chamber were coated with a mixture of the basic and acidic material added, as has

TABLE 7. BASIC ACTIVATOR DISPERSION WITH ACIDIC MATERIALS AT HIGH TEMPERATURE

Basic Material	Acidic Material	Banbury Temp., °F.	Dump Time, Min.	Dispersion Rating (325° F.)	Dispersion Rating (220° F.)*
None	Stearic†	315	8.5	—	—
Lime	Lauric	325	6.5	S	—
	Oleic	325	6.5	S	P
	Palmitic	325	6.5	S	—
	Stearic	325	6.5	S	VP
	Stearic†	325	6.5	S	—
Litharge	Lauric	315	8.5	F	—
	Oleic	316	8.5	F	P
	Palmitic	320	8.5	F	—
	Stearic	324	8.5	P	VP
	Stearic†	322	8.5	P	—
Maglite D	Lauric	325	6.5	VP	
	Oleic	325	6.0	VP	VP
	Palmitic	325	6.5	VP	—
	Stearic	325	6.0	VP	VP
	Stearic†	325	6.5	VP	—
Zinc oxide	Lauric	307	8.5	S	—
	Oleic	309	8.5	S	—
	Palmitic	307	8.5	S	—
	Stearic	305	8.5	S	P
	Stearic†	308	8.5	S	—

* From Table 6.
† Double pressed.

TABLE 8. EFFECT OF RUBBER TYPE ON ZINC OXIDE-STEARIC ACID DISPERSION

Rubber Type	Rubber, Gms.	ZnO, Gms.	Stearic Acid, Gms.	Banbury Dump Temp., °F.	Dispersion Rating
Chemigum N 600*	980	49.0	19.6	244	S
Enjay Butyl 365†	920	46.0	18.4	196	VP
Neoprene GNA‡	1230	61.5	24.6	232	P
Neoprene W‡	1230	61.5	24.6	240	P
SBR 1502	940	47.0	18.8	239	S
SBR 1712	950	47.5	19.0	200	P

* NBR, Goodyear Tire & Rubber Co., chemical division, Akron, O.
† IIR, Enjay Chemical Co. Division, Humble Oil & Refining Co., New York 19, N. Y.
‡ CR, E. I. du Pont de Nemours & Co., Inc., elastomer chemicals department, Wilmington 98, Del.

been mentioned previously. Since cooling water at 48° F. was used, it may be that the surfaces of the Banbury rotor and chamber were at a temperature substantially below that of the rubber, as shown by the temperature recorder, and below that of the melting points of the reaction products of the basic and acidic materials being used.

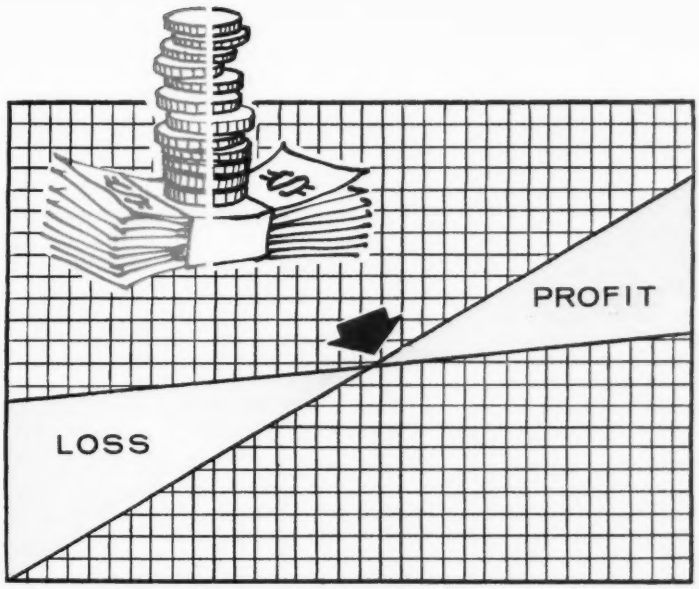
Higher mixing temperatures have improved the dispersions of both lime and zinc oxide in natural rubber; both materials give satisfactory dispersions with all the fatty acids tested (Table 7). Dispersion of litharge has also been improved, but it is still not completely satisfactory.

APPENDIX

Trade Name	Description	Supplier
Aktone	Urea complex	J. M. Huber Corp., New York 17, N. Y.
Antioxidant 2246	2,2′-methylene-bis-(4-methyl-6-tert.-butyl phenol)	American Cyanamid Co., rubber chemicals department, Bound Brook, N. J.
Atomite	Calcium carbonate, water ground	Thompson-Weinman & Co., New York 17
Calcene CO	Calcium carbonate, prec.	Columbia-Southern Chemical Corp., Pittsburgh 22, Pa.
Carbowax 6000	Polyethyleneglycols	Union Carbide Chemicals Co., New York 17
Cumar MH 2½	Coumarone indene resin	Allied Chemical Corp., Plastics & Coal Chemicals Division, New York 6
Elastopar	N-methyl-N, 4-dinitroso aniline, 33⅓%	Monsanto Chemical Co., rubber chemicals department, Akron, O.
Esen	Phthalic anhydride	Naugatuck Chemical Division, United States Rubber Co., Naugatuck, Conn.
Laurex	Zinc laurate	Naugatuck Chemical
Maglite D, K, L, M, Y	Magnesium oxide	Merck Marine Magnesium Division, Merck Co , Rahway, N. J.
Marinco CL	Magnesium carbonate	Merck Marine Magnesium Division
Natac	Blend of resin acids and amine resin soaps	J. M. Huber Corp.
Neozone D	Phenyl-b-napthyl-amine	E. I. du Pont de Nemours & Co., Inc., elastomer chemicals department, Wilmington 98, Del.
NOBS Special	N-oxy diethylene benzothiazole-2-sulfenamide	American Cyanamid rubber chemicals department
Octamine	Dioctyl dipheyln-amine	Naugatuck Chemical
Polymel DX	Styrene-indene copolymers	Polymel Corp., Baltimore 2, Md.
Retarder PD	Phthalic anhydride and dicyan-diamide	American Cyanamid, rubber chemicals department
Retarder W	Salicylic acid	Du Pont elastomer chemicals department
Santocure	N-cyclohexyl-2-benzothiazole sulfenamide	Monsanto rubber chemicals department
Staybelite resin	Hydrogenated rosin	Hercules Powder Co., Wilmington 99
Super Multifex	Calcium carbonate, prec.	Diamond Alkali Corp., Cleveland 14, O.
Thionex	Tetramethyl thiuram monosulfide	Du Pont elastomer chemicals department
Turgum S	Terpene-rosin acid blend	J. M. Huber Corp.
Vultrol	N-nitrosodiphenylamine	B. F. Goodrich Chemical Co., Cleveland 15, O.

Magnesia gave very poor dispersion in natural rubber in the presence of the fatty acids, regardless of the mix-

(Continued on page 77)



The BREAK EVEN POINT

By SPENCER A. TUCKER
Martin & Tucker, Little Neck, N. Y.

THE billion-dollar corporation and the small shop have entirely different problems, but they share the same objectives:

1. To maintain or increase profits.
2. To meet competition from others in the field.
3. To survive a possible downturn in business.

Management decisions on company expansions, changing the size of the work force, changing prices, going into production of new products, or changing the mix of current products must be justified by their effect on the three major company objectives. The more accurate a manager's information on what effect a particular change will have, the more easily he can reach a decision which will benefit his company.

Testing Decisions in Advance

The break-even chart is a device for testing in advance the effect of management decisions. Break-even charts tell:

1. The impact of price reductions.
2. The effect of automation.
3. The impact of increasing staff.
4. The effect of a change in product mix.
5. How and when to cut prices.

And much more.

Basically the break-even chart is a method of comparing sales and costs to find out the profit trend. Unlike the conventional method of estimating expenses as a lump sum, the break-even chart divides them into fixed and variable costs. Variable costs are those which change with volume of production, such as materials, direct labor, power costs, and so on. Fixed costs are those which remain the same, like depreciation and rent. Some expenses, like supervision, are partly fixed and partly variable.

Here is a typical segregation of fixed and variable expenses at the $1,200,000 sales level:

		KIND OF COST		
Expense	Total Cost	Kind of Cost	Fixed Cost	Variable Cost
Direct materials	$350,000	Variable	—	$350,000
Productive labor	200,000	Variable	—	200,000
Mfg. overhead	250,000	Both	$200,000	50,000
Administrative exp.	100,000	Both	75,000	25,000
Selling expenses	100,000	Both	45,000	55,000
TOTAL EXPENSES	$1,000,000		$320,000	$680,000

The conventional profit and loss sheet would simply divide the $1,000,000 in expenses into $800,000 total manufacturing costs and $200,000 sales and administrative expenses. The break-even sheet divides it differently, into $680,000 variable cost and $320,000 fixed cost. The conventional division is static. The break-even divi-

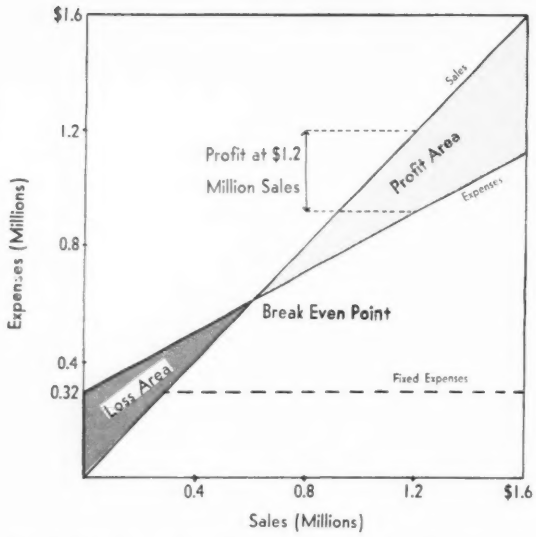


Fig. 1. Here is a typical break-even chart. This company has fixed costs of $320,000 and variable expenses of $680,000 at $1,200,000 sales. The break-even point, where sales and expense lines cross, is $610,000

sion is more useful in that it shows quickly the variation in expenses with changes in sales volume.

Figure 1 shows the break-even chart drawn from the data above. The horizontal base line is the sale capacity in dollars, and the left vertical line expenses in dollars. The fixed expense line, dotted, remains the same for all sales levels. The total expense line is drawn from the minimum of $320,000 at zero sales, since there are no variable expenses at that point, to a maximum of $1,000,000 at maximum sales.

The Break-Even Point

The point at which this total expense line crosses the sales line is the break-even point. In this case it is $610,000. Below this point there are losses, and above it profits are made.

When the break-even point rises, a company has to sell more to maintain its level of profit. When the break-even point falls, the company has to sell less. Sometimes a rise makes the company vulnerable to price reductions. At times it imposes psychological pressures which lead to desperation pricing.

Adding equipment or personnel can raise the break-even point. This may be good or bad, depending on the company's future sales picture.

If equipment is added, this will raise fixed expenses and make for large profits in boom times. But in periods of recessions when sales drop, the company will be in a tight spot since it cannot readily lower its fixed expenses in proportion to lower income.

If the break-even point rises because of increasing a variable expense, such as costs of an increased work force, then the company will not make so much profit in boom times, but can maintain its profits more readily when sales drop, since its expense pattern will be easier to change.

Prepare for Bad Weather

Making decisions on whether or not to expand based on today's volume and market is like building a house without a roof on the assumption that it will never rain. It is more sensible to check the weather forecasts and to prepare for the possibility that the forecasts may be wrong.

Figure 2 shows the before and after break-even points of a company that wishes to expand its capacity by 40%. Its fixed costs are $800,000, and its variable costs 45%, or $931,500 at its maximum sales level of $2,070,000. Its break-even point is $1,450,000, as shown by the intersecting lines on the chart. At the maximum sales level of $2,070,000 its profits are $350,000.

Getting 40% more capacity with added equipment would raise fixed expenses to $1,000,000, an increase of 25%. Variable costs would still remain 45% of sales. The new break-even point, as shown on the chart, would be $1,820,000, an increase of $370,000 over the old break-even point.

The planned expansion is designed to bring maximum sales capacity to $2,900,000, which would give a profit of $595,000 at the maximum sales level. This is a sizable increase over the previous profit of $350,000 at full capacity.

However, with additional load of the new equipment, sales would have to be $2,460,000 instead of the previous $2,070,000 in order to make the same amount of profit as the previous maximum—$350,000. This means there must be an increase in sales of more than $390,-

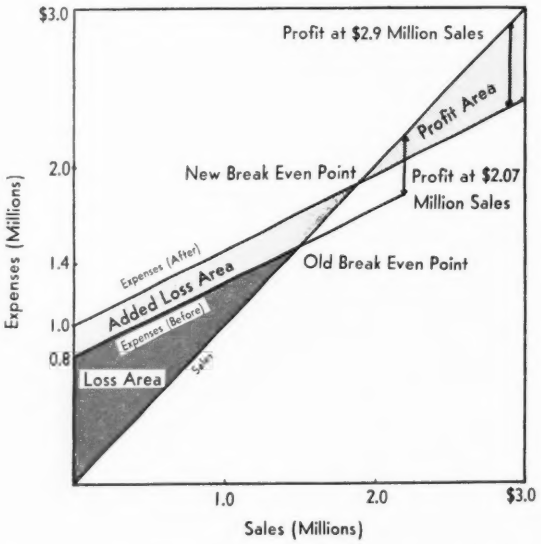


Fig. 2. At maximum sales of $2,070,000, this company has profits of $350,000. Expanding capacity 40%, to $2,900,000 sales, raises maximum profits to $595,000, but also raises the break-even point from $1,450,000 to $1,820,000. An $830,000 increase in sales will raise profits $245,000. A $170,000 decrease in sales will eliminate profits

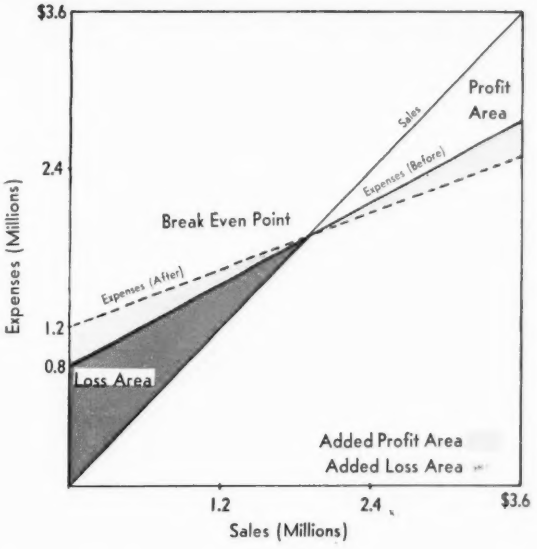


Fig. 3. Here fixed costs have been raised, but variable expenses cut, leaving the break-even point the same. This means greater profits above the break-even point, greater losses below it

000 in order for the expansion to bring an increase in profits.

What happens if the company does not get the increases it expected after it committed itself to the expansion? Suppose sales don't go above the old maximum of $2,070,000? Then the profits would be only $138,500. *This is a 61% drop in profits.*

Obviously, if sales dipped slightly, below $1,820,000, a loss would be created. This would be a 100% drop in profits caused by a 13.7% drop in sales. This is an example of loss vulnerability.

Buying new equipment is not the only action that may boost loss vulnerability. Many companies boost the level of their fixed expenses by retaining permanent departments, making instead of buying parts and equipment, hiring permanent staffs for non-production services instead of hiring the services, indulging in unjustified "front" expenses and failing to police creeping losses, thus acquiring a rigid fixed-expense pattern which requires major surgery to remove.

Cutting Variable Expenses

This does not mean that an increase in fixed expenses is necessarily bad. Under certain conditions it can result in an improved profit picture. Figure 3 shows what happens when a company cuts variable expenses, such as wage costs, by investing in additional or improved equipment. In this case the decrease in variable expenses balanced the increase in fixed expenses, leaving the break-even point at the same level as before the expansion.

Notice that all sales over the break-even point bring a greater profit than the company enjoyed before the expansion. If sales fall below the break-even point, losses are greater than before the expansion. Under certain conditions a saving in variable expenses can more than balance the increase in fixed costs, lowering the break-even point. The key here would be what sales can reasonably be expected in the future. If chances for increased sales are good, the odds are for expansion.

The break-even chart also shows the ability to cope with competition. Figure 4 shows the expense pictures of two companies in exactly the same industry, making the same profit at present sales of $1,200,000. However, because of their different internal economies, their earnings are considerably different below this level.

Company A bought additional equipment with an eye to higher profits, but had excessive fixed costs owing to overly large administrative expenses. Because Company A obtained low productivity in its manufacturing operations, it did not obtain a sufficient decrease in variable expenses to justify the increase in fixed costs which resulted from buying the additional equipment.

Company B used older equipment, but squeezed every last cent out of it, farmed out some of its production work, and had a tight control on methods and costs.

Both companies are making the same profit of $300,000 at the present sales point of $1,200,000. Above this point Company A will make more profits than Company B. *But it is gaining a possible increase in profits at the risk of potentially great losses.*

Loss Vulnerability

Notice that Company A's break-even point is $618,000, and Company B's break-even point $300,000. With sales volume at $300,000, Company B will break even, but Company A will lose $320,000. *At any point below the present $1,200,000, Company A will make lower profits than Company B.*

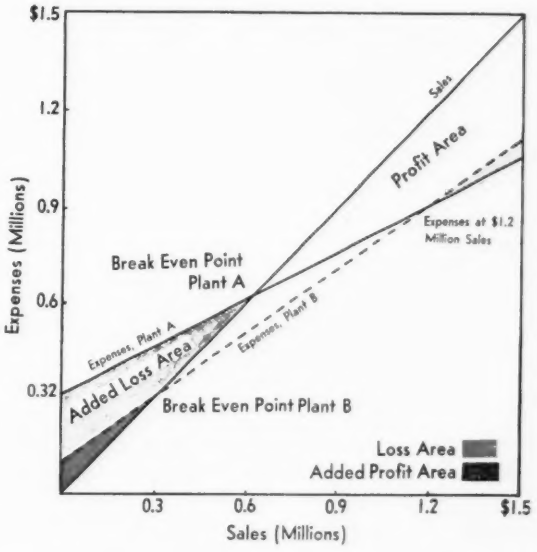


Fig. 4. Companies A and B are making the same profit of $300,000 at present sales point of $1,200,000. Above this point Company A will make higher profits. But with greater fixed costs than Company B it has potentially much greater losses

To survive a drop in sales, or a drop in dollar sales because of lower prices, Company A would have to sell off equipment, eliminate administrative activities, and improve operations in a hurry. Company B would not have to worry about a drop in sales revenue, because the larger portion of its expenses is variable and easily adjusted to volume dips.

Under certain conditions, it pays to cut fixed costs even at the expense of raising total costs. This would apply to situations where it costs more to hire services than to build them into the company structure, or where purchase of new equipment cuts total costs, but makes the ratio of fixed to variable costs overly high.

In Figure 5, Company Y has a lower total expense than Company Z, but has a *higher* break-even point. Company Y has a larger investment in machinery than Company Z. Company Z uses production wage incentives for boosting output and has more hand operations than Company Y. As a result, it has a higher labor cost per unit of production. However, at sales below $.68 million it is making higher profits than Company Y, and below $.65 million it is still making profits, whereas Company Y is losing money.

No Pat Answer

In manufacturing nothing stands still. Market conditions change; new products are developed, and newer equipment becomes available to replace the old. As consumer habits change and manufacturing techniques develop, some operations become obsolete, and new ones become necessary. When these changes occur, management must make decisions. Should they expand facilities, enlarge buildings, add new machines, boost prices, and develop new products? Or should they reduce prices and sell off equipment as well as cut their administrative and research staffs?

There is no pat answer for all companies. A move may strengthen one company and prove poison to another. By proper use of sales and expense data and break-even charts, management can predict the effect that changes will have on its company's operations and thus plan a safe course for the future.

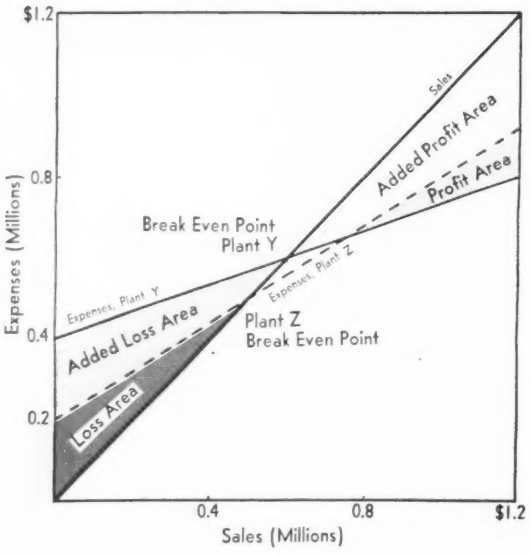


Fig. 5. Company Y has a lower total expense than Company Z at maximum sales, but a higher break-even point. At any point below $.68 million Company Z will make greater profits because of its lower fixed costs

The Author

Spencer A. Tucker, a partner in the firm of Martin & Tucker, is the author of some four books and 80 articles on various aspects of scientific management.

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Silicone Cable Jacket Tested by Air Force

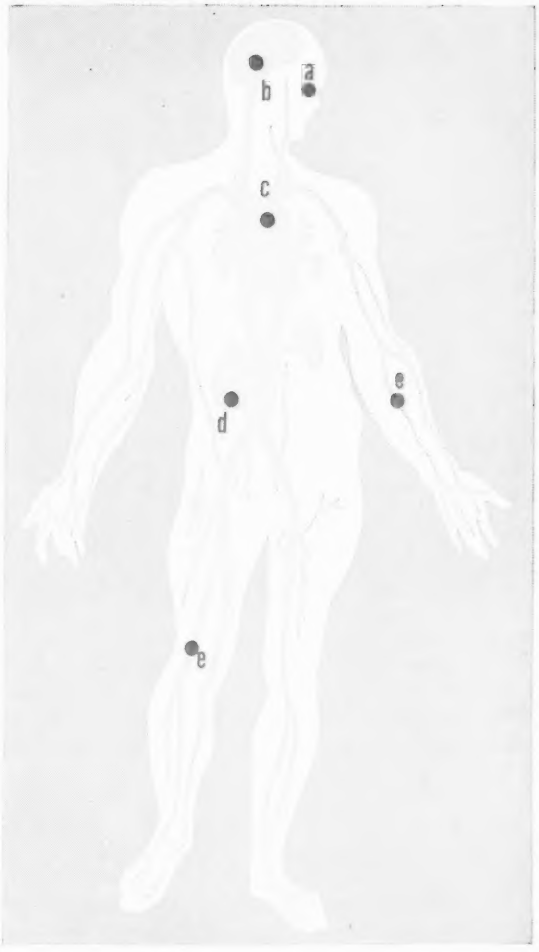
Coaxial cable jackets which are made of extruded chlorinated ethylene-propylene resin and silicone rubber fiber braids showed approximately 14 times the abrasion resistance of conventional jackets which are made of silicone-varnish impregnated glass-fiber braids in abrasion tests conducted by the United States Air Force.

According to a report just published by the Air Force, "Abrasion Resistance of High-Temperature Coaxial Cable Jackets," by Capt. B. Suverkrop, of the Electronic Technology Laboratory, Wright Air Development Division,[1] the new materials showed their longer life and greater reliability at temperatures up to 200° C. Above that temperature the standard jackets were found to be superior.

Tests were conducted on an electric abrasion machine which subjected the cables to conditions simulating actual use when cables are routed over sharp edges of sheet metal in aircraft. Cables ranged in size from a 0.387- to 0.462-inch overall diameter. The samples tested were chosen because of specific jacket construction and similarity in overall diameter. In addition to having greater abrasion resistance, the silicone rubber-polyester fiber braid cable proved somewhat more resilient and flexible than the other two cables that were tested.

[1] 12 pages. Order PB 171-118, Office of Technical Services, United States Department of Commerce, Washington, D. C. 50¢ a copy.

Silicone in Surgery



Silicone rubber has been used by surgeons to repair a variety of damaged or deformed organs of the body. Operations include: (a) restoring sight to persons with detached retina of the eye, (b) curing "water on the brain," (c) replacing leaky heart valves, (d) repairing a diseased kidney, and (e) replacing damaged tendons of the arms and legs

SILICONE rubbers, best known for their industrial uses, are beginning to play a major role in medicine through their use as replacements for injured and diseased parts of the body. In the future their role may be even greater, thanks to the efforts of silicone-producing Dow Corning Corp.

The property which makes silicone rubber so valuable for prosthetics, that is, replacements of body parts, is its chemical inertness. Because this rubber won't react with body tissues, it does not injure the tissues. At the same time it is not injured itself by the body fluids. These properties are not true of other rubbers or plastics tested.

As a result, silicone rubbers have been used successfully for the following purposes, among others:

1. To replace faulty heart valves.
2. To repair tears in the dura mater, the membrane that covers the brain.
3. To restore sight to hundreds of persons with detached retinas of the eye.
4. To save the lives or minds of thousands of babies with hydrocephalus, the all-too-familiar "water on the brain."
5. To repair tendons in crippled arms and legs.
6. To reconstruct the faces and bodies of men and women disfigured by accident or disease.

Silicone rubbers have been used in medicine almost since their development at the end of World War II. The spread in their use, however, has been hampered by lack of information about what has been done by the pioneers and what can be done in the future.

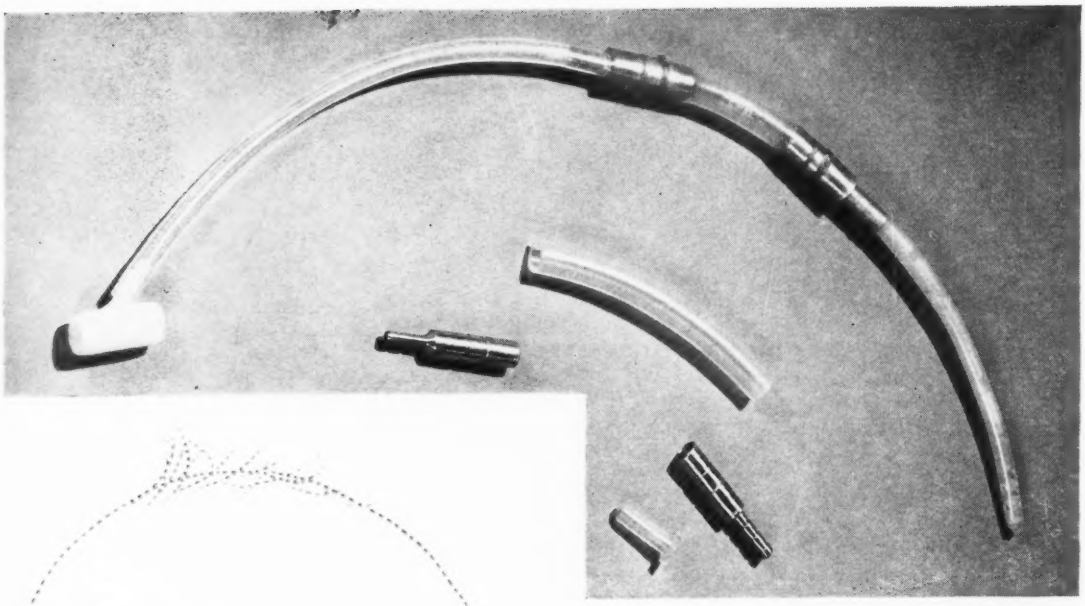
If an industrial application needs a particular rubber, chemists and engineers have a battery of standard tests to measure the rubber's resistance to oils and solvents, tensile strength and other properties. No such tests are available to duplicate in the laboratory the reaction of a material in contact with living cells. Rubber must actually be used on patients and laboratory animals to learn its properties.

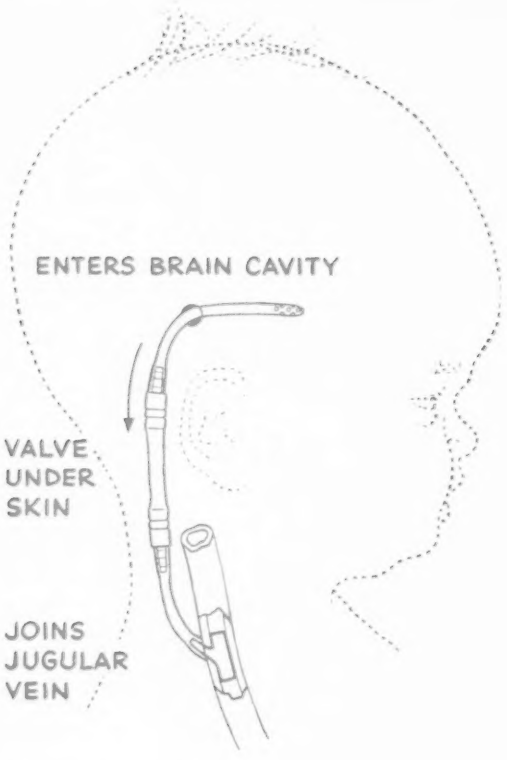
This lack of information is not the only one. First, few doctors are experts in materials engineering. Second, use of a silicone rubber prosthetic in one specialty such as heart disease should suggest its use in other fields. But an article published in a specialized medical journal normally would be read only by specialists in that field.

Medical Research Center

Dow Corning Corp. provided what it hopes will be the answer to the problem, in August of 1959, when it set up a Center for Aid to Medical Research. The Center has three purposes:

To collect and give out information on medical uses of silicone so that doctors in all special-





One of the major uses of silicone rubber is in surgery on infants with hydrocephalus, or water on the brain. Tubing is inserted into the brain cavity, going from there to the jugular vein to drain off excess fluid, and a two-part valve keeps blood from draining back into the brain cavity, as shown in the diagram at the right. Above is the device designed for this surgery, with parts of the valve. All except the two metal parts are made of silicone rubber

ties will be able to keep up with new applications.

To provide technical aid, working out ways of making devices needed by doctors for particular surgical applications.

To probe deeper into the chemistry of silicone polymers used in the human body.

The non-profit center was set up only after four years of requests from doctors for samples and technical assistance in use of silicones had convinced Dow Corning that such an organization was needed. Dr. R. R. McGregor, who had been answering the requests and questions, was made director of the Center. Silas Braley, formerly of the Silastic section of the product engineering department, was named executive secretary.

When the Center was opened the number of letters and calls was still comparatively small. A year later 50 long-distance phone calls, 250 letters, and 90 requests for samples were received each month. These figures are expected to double or triple within the next year.

Dow Corning points out that only a few calls or letters can be given a routine answer. In most cases the answer to the letter must be found in the laboratories, and this may take days or weeks.

Center Publishes Journal

In order to give some of the general answers, the Center a year ago began to publish a quarterly journal on silicone research in medicine. Copies were sent out only by request and only to physicians and surgeons doing original research. From 1,200 copies of the first issue, circulation has risen to 2,700. These go to doctors in every state and 34 foreign countries, and the circulation is expected to rise geometrically as doctors become acquainted with the publication.

As early as 1920, doctors were trying to use rubber for medical purposes, since all but the bony and fluid parts of the body have characteristics similar to those of rubber. They have resilience, resistance to fatigue, elongation, and something resembling elastic memory.

Unfortunately, doctors trying to use rubber for medical purposes found unexpected difficulties. In 1920 a medical article reported that rubber tubing for trans-

Silicone rubber valves have been devised for defects in the four major heart valves. Shown from above, these are (a) the pulmonary valve, (b) the aortic valve, (c) the mitral valve, and (d) the tricuspid valve. The heart is divided into four chambers. Blood coming from the veins goes into the right auricle, passes through the tricuspid valve into the right ventricle, and is pumped through the pulmonary valve to the lungs. From there it goes back to the left auricle and through the mitral valve to the left ventricle, where it is pumped out through the aortic valve to the arteries

fusions caused irritation to body tissues, and in 1960 another article stated that blood clots following transfusions were caused by toxic agents in plastics as well as rubbers.

Although there weren't too many persons who knew about silicone rubber, it had been tried by a handful of doctors since 1946. This was not only because silicone rubber was non-toxic, but because it does not support tissue growth. This property prevents the growth of tissues within such devices as artificial heart valves, and the hardening of implanted silicone rubber sponge by scar tissue. Better still, it was found that Silastic retarded formation of blood clots, a very useful characteristic in heart or brain operations.

The Major Advances

Here are a few of the major events in the field:

1946—Silicone rubber used to reconstruct the common bile duct, which carries bile from the liver to the small intestine.

1948—Silicone rubber tube used to replace the urethra, the tube running from the kidney to the bladder.

1952—Dow Corning introduced the first silicone rubber specifically designed for medical purposes. This was a pure polysiloxane polymer with a fine particle size synthetic silicone filler.

1953—Lucite ball valve used to replace the aortic valve of the heart, which feeds blood into the body's main artery.

1954—Silicone rubber ball valve used in operation on dog, found to reduce tendency of blood clots and cause less blood damage than hard Lucite ball. Lucite discarded in favor of Silastic-coated nylon ball.

1958—Solution found to problem of anchoring Silicone rubber valves which won't support tissue growth. Valve glued to strip of plastic. Tissues grow into plastic, anchoring it firmly. First operation, on Minnesota woman, unqualified success.

After 1954 events moved faster. In 1956, doctors in Philadelphia, Pa., and Pasadena, Calif., developed similar valves of Silastic rubber to cure the dread disease of hydrocephalus, which attacks 6,000 children in the United States every year. Over the next four years 10,000 children were treated, and 75 to 85% of the operations were successful. The operation calls for insertion of a tube which drains accumulating fluid back into the veins.

Only recently, Silastic patches were used to cover perforations of the ear drum, preventing infection, promoting healing of the ear drum, and restoring normal hearing where the ear bonelets still work.

2,000 Regain Sight

The above is not so dramatic as the 2,000 cases of persons whose sight was restored after the retina of the eye had been detached by accident or disease. Silicone rubber tubes or rods were used to brace the membrane which supports the retina, restoring contact between the retina and its support and restoring sight.

Silicone prosthetics have also been used to repair hernia, to replace injured tendons in arms and legs, and to repair tears in the dura mater.

One of the most recent and most striking uses of Silastic is in plastic surgery. Silicone sponge is used to replace missing or injured flesh, restoring the natural shape of the face or other part of the body. According to Dr. James Barrett Brown, the result shave been spectacular, restoring patients to mental as well as physical well being.

Dr. Brown noted that many materials had been tried for this type of work, including halogenated hydrocarbons and poly(vinyl alcohol). The silicones were the most promising because they are inert and because they have a density and hardness similar to those of the tissue they replace. Actually, density of the rubber is varied according to the part of the body where it is to be used.

Although much progress has been made in the field, Dow Corning feels that establishment of its Center will make possible much more rapid progress by rapidly disseminating information on research.

Silicone Uses Specialized

No matter how important silicone rubbers become in the medical field, however, Dow Corning doesn't expect to make much money as a medical supplier. The trouble is that such standardized items as bulbs, bags, bottles, and medical gloves are low priced items, and silicone rubber is not.

This is true, they say, even in the case of catheters, stomach-pump tubing, and other items where the lack of irritation is desirable. They are just too expensive to be used once and discarded, as is usual. However, some toxic substances, such as pyrogens, are not destroyed by sterilization, and the cleaning necessary for reuse takes a good deal of costly labor.

The price of silicone rubber is not important in the items used to replace faulty organs, but there is little standardization of designs, sizes, and shapes. This fact means that making them is almost a hand operation, rather than a mass-production operation. It is hard, moreover, to maintain the proper precision of parts and the cleanliness necessary for such items while making them on a regular industrial line.

At best, little silicone rubber is used in medical items, even when they can be made by mass production. Less than an ounce of Silastic is used in the valve and tubing for hydrocephalus operations, according to Dow Corning. Even if every afflicted child were operated on, this practice would mean a use of less than 400 pounds of silicone rubber a year.

On that basis, it is difficult to make a profit and loss case for operating the Center for Aid to Medical Research. But Dow Corning feels that the number of lives saved outweighs the economic considerations. As one executive put it:

"When you see how desperately the doctors need our help, and how grateful they are for understanding their problems, how can we refuse to help?"

CALENDAR of COMING EVENTS

March 17
Boston Rubber Group. Hotel Somerset, Boston, Mass.

March 23
Quebec Rubber & Plastics Group.

March 24
New York Rubber Group. Henry Hudson Hotel, New York, N. Y.

April 4
The Los Angeles Rubber Group, Inc.

April 6
Akron Rubber Group.
Rhode Island Rubber Club.

April 13
Fort Wayne Rubber & Plastics Group. Van Orman Hotel, Fort Wayne, Ind.

April 18-21
Division of Rubber Chemistry, American Chemical Society. Brown Hotel, Louisville, Ky.

April 19
Quebec Rubber & Plastics Group.

April 21
Detroit Rubber & Plastics Group, Inc.

April 28
Chicago Rubber Group. Furniture Club, Chicago, Ill.

May 2
The Los Angeles Rubber Group, Inc.

May 8-13
ISO/TC 45. Milan, Italy.

May 12
Buffalo Rubber Group. International Meeting. Sheraton Brock Hotel, Niagara Falls, Ont., Canada.

May 19
Connecticut Rubber Group.

May 21-30
American Chemical Society. St. Louis, Mo.

June 1
New York Rubber Group. Outing. Old Cider Mill Grove, Union, N. J.

June 2
Quebec Rubber & Plastics Group. Golf Outing. Ste. Hyacinthe, P.Q., Canada.

June 7-8
Tlargi Foundation Second Annual Technical Conference. Mayfair Hotel, Los Angeles, Calif.

June 9-11
The Los Angeles Rubber Group, Inc. Summer Outing. Stardust Hotel, Las Vegas, Nev.

June 13
Buffalo Rubber Group. Outing. Lancaster Country Club.

June 16
Akron Rubber Group. Outing. Firestone Country Club.
Boston Rubber Group. Outing. Andover Country Club, Andover, Mass.

June 23
Detroit Rubber & Plastics Group, Inc.

June 23-24
Southern Rubber Group. Buena Vista Hotel, Biloxi, Miss.

June 28-30
Committee D-11, ASTM. Atlantic City, N. J.

August 3-5
Chemical Institute of Canada. Canadian Chemical Conference and Exhibition. Queen Elizabeth Hotel, Montreal, P.Q., Canada.

August 4
Division of Rubber Chemistry, Chemical Institute of Canada. Conference. Montreal, P.Q., Canada.

August 10
New York Rubber Group. Golf Outing. Scotch Plains and Echo Lake Country Clubs.

September 3-8
American Chemical Society, Chicago, Ill.

September 5-8
Division of Rubber Chemistry, ACS, Hotel Sherman, Chicago, Ill.

September 9
Connecticut Rubber Group. Outing.

September 29
Akron Rubber Group.

October 5
Detroit Rubber & Plastics Group, Inc.

Available Synthetic Rubber Latices

A complete list of synthetic rubber latices available in the United States and Canada including Acrylic, SBR, CR, Fluorocarbon, IIR, and NBR types for use in the rubber, textile, paint, paper and adhesive industries

CONTINUING the series of tabulations of presently available rubbers and resins, we are very pleased to be presenting this month this list of latices. Many requests for this information have been received, and we are happy to provide this service.

A major problem with lists of this nature is the extremely large number of changes which take place between the time we receive the latest information from suppliers and the time the list appears in print. We hope, however, that this list will provide most of the grades available and serve as a guide for adding new grades as they become commercial.

The great complexity of the latex field makes it quite difficult to develop a style for this table. There might be some merit to setting it up on a use basis, but overlapping uses and lack of information make this unsatisfactory. The great variety of coding systems also presents problems of arrangement. Since only a small percentage of the grades are listed under the ASTM numbering method, it seemed most desirable to list by trade name. It is unfortunate that the trend toward adopting ASTM numbering for dry SBR materials has not yet been followed for latex products. Perhaps the varied uses of latex make such a numbering system impractical or unnecessary, but it would seem that it might be a help to the latex technologist in trying to select grades for trial in his particular use problem.

Latices are used in many industries. In addition to producing products which are "rubber products" in final form, vast quantities are used in textiles in many ways, paper products, and in paints. Large amounts are also used in adhesives, inks, and finishes.

Extensive research is going on in all of these fields, and grades of latex specifically designed for one or more use are introduced regularly. This practice has created a large number of grades without such modifications as oil extension of black masterbatch that have increased the dry SBR list.

One recent development of note was the introduction of synthetic latices which could replace natural latex in many foam applications. It may be expected that this type of development along with possible future introduction of stereo specific latices of polyisoprene and/or polybutadiene will continue to create growth and new uses for synthetic rubber latex.

NOTE: In the interest of clarity and uniformity, values for % solids, Mooney viscosity, % bound styrene, specific gravity, and pH are expressed as a single number representing a typical or average value. Information from suppliers often is expressed as a range or may vary slightly from the values listed in this table. EDITOR.

ABBREVIATIONS FOR SYNTHETIC RUBBER LATICES TABULATION

Abbrev.	Description
AI	Anionic
AM	Ammonium Soap
AN	Acrylonitrile
Bu	Butadiene
BC	THE BORDEN CHEMICAL CO.
Bd. AN	Bound Acrylonitrile
Bd. Sty.	Bound Styrene
C	Cold Rubber
CR	COPOLYMER RUBBER & CHEMICAL CORP.
DAG	DEWEY & ALMY CHEMICAL DIVISION, W. R. GRACE & CO.
DC	DOW CHEMICAL CO.
DP	E. I. du PONT de NEMOURS & CO., INC., ELASTOMER CHEMICALS DEPARTMENT
E	ENJAY CHEMICAL CO., DIVISION OF HUMBLE OIL & REFINING CO.
Emul.	Emulsifier
FA	Fatty Acid Soap
FP	FIRESTONE PLASTICS CO., CHEMICAL SALES DIVISION
FS	FIRESTONE SYNTHETIC RUBBER & LATEX CO.
G	GENERAL TIRE & RUBBER CO.
GC	B. F. GOODRICH CHEMICAL CO.
GG	GOODRICH-GULF CHEMICAL CO.
GT	GOODYEAR TIRE & RUBBER CO.
H	Hot Rubber
IL	INTERNATIONAL LATEX CORP., CHEMICAL DIVISION
K	KOPPERS CO., INC., PLASTICS DIVISION
KO	Potassium Oleate
MC	MARBON CHEMICAL DIVISION of BORG-WARNER CORP.
MV	Mooney Viscosity (ML 4 min. @ 212° F.)
N/B	Nitrile-Butadiene Ratio
NC	NAUGATUCK CHEMICAL DIVISION of UNITED STATES RUBBER CO.
NI	Nonionic
NS	Non-Staining
PA	PARA-CHEM, INC.
PO	POLYMER CORP., LTD.
RA	Rosin Acid Soap
RC	RUBBER CORP. of AMERICA
RT	Room Temperature
Sty	Styrene
SA	Salt Acid
S/B	Styrene-Butadiene Ratio
SC	SHELL CHEMICAL CO.
Spec.	Special
Stab.	Stabilizer
Syn.	Synthetic
TC	THIOKOL CHEMICAL CORP., CHEMICAL DIVISION

SYNTHETIC RUBBER LATICES

Acrylic

Code No.	% Solids	Stab.	Sp. Gr.	pH	Producer	Description
Acri-Flo						
151	47	AI/NI		8.0	G	For paper, leather, plastic, and rubber
Dow						
2647	47	NI	1.075	8.5	DC	Binder for exterior wood paint. Excellent tint retention. Also for pigmented paper and textile coatings
Hycar						
2600 x 30	50		1.07	6.5	GC	Leather and textile finishes. Nonwoven fabric and pigment binder. Paper saturation
2600 x 39	50		1.07	6.5	GC	Adhesives, finishes, coatings, binders
2601	50		1.06	6.5	GC	Adhesives, binders, finishes, and resin modification
2671 (2600 x 67)	50		1.06	5.8	GC	Adhesives, finishes, binders, and paper saturation
4501	50		1.06	6.5	GC	Same uses as 2601
Paranol Plastic						
F5524	48	AI	1.054	5.3	PA	Flat, pile, non-woven fabric backings. Soft, flexible films with good heat aging. Solvent resistant. Self-crosslinking
F5723	48	AI	1.054	7.3	PA	Flat, pile, non-woven fabric coatings. Good aging and solvent resistance. Tack-free. Self-crosslinking

Butadiene-Styrene (SBR) Latices

ASTM No.	Type	% Solids	MV	Stab. or Emul.	% Bd. Sty.	S/B Ratio	pH	Producers	Description
2000	H	42	70	RA	46	50/50	10.5	CR, FS, GT, NC, RC, SC	High sty., medium solids. Small particle size. Good tack
2001	H	42	30	RA	46	50/50	10.8	FS, GT, NC, RC	Lower mol. wt. to improve adhesion
2002	H	49	65	RA	46	50/50	10.5	FS, NC, RC	Extra lt. color and medium high solids
2003	H	59 min.	73	FA/RA	29		10.3	FS	High solids. Used with NR latex in foam. Added to plastics and resin latices
2004	H	57 min.		FA/RA	None		10.3	FS	Bu. homopolymer. Used with NR latex in foam. Impact-resistance to plastics
2006	H	27	50	FA	24		9.3	FS, NC, SC, RC	Low solids. Small particle size. Gel free
2101	C	24	High	FA	23.5	29/71	11.0	CR, SC	General purpose, low solids
2102	C	60 min.	High	KO	14	16/84	11.0	CR	High solids with low Bd. Sty. Gives low-temp. flex. in latex foam
2105	C	62	140	FA/RA	25	30/70	10.0	CR, FS, GT, NC, SC	High solids with good color. High tensile and low-temp. flexibility
2107	C	62	140	FA/RA	44	50/50	10.1	NC	Similar to 2105 with higher sty.
2108	C	40	140	FA	24	29/71	11.0	CR, GT, NC, SC	2101 with medium solids
2109	C	40	High	FA	38.5	50/50	10.5	CR	Medium high solids, high sty. and high Mooney
2110	C	64	High	KO	25	30/70	10.5	CR	2105 with better color, improved gelling
2113	C	48	130	FA/RA	44	50/50	10.5	NC	2107 with lower solids for carpet and fabric backing
3852	C	53	High	KO	24	30/70	10.0	CR	Medium solids, good color and stability
5300-X	H	52	73	RA	46	50/50	11.0	GT	2000 type for backings, adhesives, and chewing gum stock
5301-X	H	56	73	RA	46	50/50	11.1	GT	Higher solids for adhesives and chewing gum stock
5350	C	63		FA/RA	25	30/70	10.5	GT	Better color stability, higher solids, processing for latex foam Tends to thicken less when cooled below RT. Needs less gellant in NR latex blends
5352	C	69		FA		30/70	10.2	GT	Higher solids for foam and backings
5353	C	54		FA		30/70	10.9	GT	Lower solids for backings and coatings
8174	C	69	135	FA/RA	25	30/70	10.5	NC	Superhigh solids for foam rubber

BUTADIENE-STYRENE (SBR) LATICES (*Continued*)

Code No.	Type	% Solids	MV	Stab. or Emul.	% Bd. Sty.	S/B Ratio	pH	Producers	Description
Butaprene									
PL-12		48				66/34	9.2	FP	Medium-hard flexible film formation
PL-14		48				61/39	9.2	FP	Soft flexible film formation
PL-29		40					11.5	FP	Vinylpyridine polymer compatible with SBR latices
PL-30		48					9.2	FP	SBR polymer with excellent adhesion to steel. Must be baked. Alkyd compatible
PL-33		48				61/39	7.5	FP	Excellent chemical stability in solutions of multi-valent metal salts and acids
PL-39		40					11.0	FP	80% FR-S 2000/20% PL-29 blend
PL-44		48				61/39	8.0	FP	For high solids/high-speed paper coatings. High shear stability
XR-183		46					8.5	FP	Modified SBR paint latex
Darex									
620L	H	42	75	None	46	50/50	10.5	DAG	Similar to SBR 2000
622L	H	42	30	None	46	50/50	11.0	DAG	Similar to SBR 2001
632L	H	55		NS		90/10	10.5	DAG	High sty. Blends with SBR and NR latices to increase stiffness, hardness and tear resistance
640L	H	52		None		60/40	9.0	DAG	Excellent aging. For non-sulfur cured backings
641L	H	52		NS		60/40	9.0	DAG	640L with antioxidant
PL-250	H	48		None		65/35	10.5	DAG	Paint latex with high chemical and mechanical resistance
Dow									
512-K		48		NI	60	60/40	10.5	DC	Paint latex, backings, adhesives. High compatability with aqueous systems, excellent pigment binding
512-L		48		NI	60	60/40	11.5	DC	Low odor. Softer and tackier than 762-L
512-R		48		NI	60	60/40	10.5	DC	Low viscosity. For clay-coated paper
513-K		48		NI		60/40	10.5	DC	Rubber coatings and textiles
529-HS		54		NI		80/20	10.5	DC	High solids version of 529-K
529-K		45		NI	80	80/20	10.5	DC	Not a film former. Blend with 512-K, 762-K to increase film hardness
546-C		48		NI		60/40	10.5	DC	For adhesives and sizes
560		48		NI	66	67/33	10.5	DC	For Portland cement compositions
566		46		NI	60	60/40	4.0	DC	High mol. wt. For baked metal finishes
586		50		AI		100/0	8.0	DC	Blends with latices for harder films
630		48		AI			9.0	DC	For paper and board
737-K		45		NI		80/20	10.5	DC	529-K with antioxidant
762-K		48		NI	67	67/33	10.5	DC	Interior paint latex with high pigment binding and film hardness
762-L		48		NI	66	67/33	11.5	DC	762-W with low odor
762-W		48		NI	66.5	67/33	10.5	DC	Paint latex
X3339		46		NI			9.3	DC	New efficient, economical paint binder latex
Dylex									
K-31	H	48				65/35	10.0	K	Paint latex. Low foam. Superior scrub and water resistance
K-33	H	48				60/40	10.0	K	Paint latex for industrial primers
K-34	H	48				65/35	10.0	K	Paint latex. Fortified copolymer
K-40	H	47				50/50	10.0	K	For non-curing textile coatings. Contains antioxidant
K-42A	H	47				60/40	10.0	K	Stiffer than K-40
K-52	H	48				65/35	10.0	K	For paper coating. Fortified copolymer
K-54	H	48					10.0	K	For paper coating with high wet-rub and pick resistance
K-500-B	H	51				50/50	7.4	K	Water-base paint binder, primer-sealers, and backings
K-500-D	H	51				50/50	10.2	K	Same uses as K-500-B
K-600-B	H	48		AI		60/40	7.5	K	Same uses as K-500-B
K-600-D	H	48		AI		60/40	10.2	K	Same uses as K-500-B
K-700-B	H	48		AI		70/30	7.4	K	Stiffer than K-500 and K-600
K-700-D	H	48		AI		70/30	10.2	K	Stiffer than K-500 and K-600
K-900-B	H	51		AI		90/10	7.4	K	Not film forming at RT. Blends with lower sty. content latices to increase stiffness and film hardness

BUTADIENE-STYRENE (SBR) LATICES (*Continued*)

Code No.	Type	% Solids	MV	Stab. or Emul.	% Bd. Sty.	S/B Ratio	pH	Producers	Description
K-900-D	H	51		AI		90/10	10.2	K	Same uses as K-900-B
KCD-80	H	48				75/25	10.0	K	High-gloss paint latex
KCD-85	H	50				80/20	8.0	K	Good gloss and no tack for paper coatings
Flotrol									
C	H	48		None		65/35	10.5	DAG	For paper coatings. High chemical and mechanical resistance. Low viscosity formulations
FR-S									
174		51		AI	90		10.0	FS	Reinforcing and stiffening agent for NR and synthetic latices
176		53 max.	65	AI	46		11.0	FS	General purpose. Resistant to ultraviolet light, heat aging, gas fading
194	C	60	135	FA/RA	25		10.0	FS	Backings, coatings, and adhesives
200		64 min.	130	FA	28		10.0	FS	High solids for foam. Alone or in NR blends. Excellent gel sensitivity, good structure, accepts high pigment loading
Gen-Flo									
62	H	48		AI	60	60/40	10.5	G	For paint and paper
67	H	48		FA/RA	67	67/33	11.0	G	For paint and paper
Hycar									
2507		41					8.0	GC	For adhesives, resin modification
2508		33					9.0	GC	Bu., sty., vinyl pyridine terpolymer. For adhesives and tire cord dips
2570 x 2		41					8.0	GC	Modified SBR latex. General-purpose coatings and carpet backings
2570 x 5		41					6.5	GC	Backings, coatings, binders, and finishes
IRS 2000									
Concentrate		60				50/50	10.0	RC	Adhesives, coatings, impregnating compounds. Same as 2000 with higher solids
Marbon									
4950		34	High	Soap			9.5	MC	Reinforcing latex for paper and textiles
7345		50	High	Low soap			11.0	MC	Reinforcing and stiffening modifier for NR, SBR, NBR, and CR latices and for heat seal foam
16111	H	42	25	Spec. RA		50/50	11.0	MC	Soft polymer with higher tensile than SBR 2001
16310	H	49	75	Spec. RA		50/50	11.0	MC	Improved SBR 2000 type
16320	H	53	High	FA		30/70	11.0	MC	Similar to SBR 2003
16340		52		AI			9.5	MC	Film-forming carboxylic terpolymer. Excellent color, non-cure latex
16350		52	High	Spec. RA			11.0	MC	Reinforcing and stiffening modifier for NR, SBR, NBR, and CR latices
Naugatex									
2711	H	53	60	RA	59		11.0	NC	Higher film strength than SBR 2000
2714	H	54	High	RA	82		11.5	NC	Blends with NR and SBR latices for foam. Increases pile lock in carpet backing
2733	H	48	55	NI*	58		10.0	NC	Binder. Excellent stability and light aging
2734	H	46		NI*	64	65/35	11.0	NC	Good binding strength for paint
2740	H	40	50	RA	53		11.0	NC	Good color, wet strength, and internal bond
2752	H	48		AI	49	50/50	8.5	NC	Excellent chemical and mechanical stability. High water and binding strength
Paranol									
100	H	50		AI	48	50/50	11.25	PA	Good heat, light resistance. Carpet and upholstery backings
250	H	50		AI	46	50/50	9.1	PA	Self-curing, contains antioxidant. For carpet and upholstery backings
263	H	50		AI	54	60/40	9.1	PA	Self-curing, contains antioxidant. For carpet backings

* Emulsifier is sulfonate plus nonionic.

Butadiene-Styrene (SBR) Latices (*Continued*)

Code No.	Type	% Solids	MV	Stab. or Emul.	% Bd. Sty.	S/B Ratio	pH	Producers	Description
Paranol (*Cont'd*)									
265	H	50		AI	47	50/50	11.0	PA	Self-curing, contains antioxidant. For drapery and upholstery fabric. Excellent aging
300HS	H	51		AI		85/15	11.0	PA	High sty. Excellent heat, light aging. For fabric stiffening
Pliolite (Resin)									
140		48		Syn. AI		60/40	9.5	GT	For textiles, inks, carpets
151		52		RA		85/15	11.0	GT	Not film forming below 350° F. For blending with other latices for stiffness and increased modulus
160		49		Syn. NI		67/33	9.5	GT	Forms film at RT. Excellent adhesion and clarity
170		45		AM		70/30	9.5	GT	Volatile emulsifier for water resistance. Forms film at RT. For paper coating in combination with microcrystalline waxes
Polyco									
350-35NS		45				65/35	9.3	BC	Resists mechanical coagulation. Tolerates appreciable amounts of solvents, acids, salts, and polyvalent ions
350-W		48				60/40	9.6	BC	Stable at high pigment loads under shear. Binder for pigments in coated papers
556-W		47.5				67/33	9.6	BC	Paint latex. Stable to multivalent ions. Alkyd compatible. Heat, light resistant
807		47.5				67/33	10.0	BC	Paint latex. Fine particle size. High pigment binding, low odor. Freeze-thaw and high mechanical stability
2410		51				70/30	10.2	BC	Pigmented rug backings. Excellent coatings with protein or starch. Stable with di- and trivalent ions
2412		48				60/40	9.6	BC	Unstripped. Use where odor unimportant
2413		51				70/30	7.5	BC	Pigmented rug backings. Binder for fabric backings. Paper clay coatings with protein or starch
2414		51				90/10	10.0	BC	Increases strength and stiffness of SBR latices. Stable in presence of di- and trivalent ions
2422		51				90/10	10.0	BC	Increases strength and stiffness of SBR latices
XP24-97		46					4.0	BC	Industrial finishes. Requires baking with metal catalyst
Polysar									
IV	H	43	90	RA		50/50	10.5	PO	Equiv. to SBR 2000 for tire cord, adhesives, coatings, and polish
722	C	64	150	FA		25/75	10.3	PO	High solids for foam, adhesives, and carpet backings
723	C	65	150	FA		30/70	10.5	PO	High modulus to replace NR latex in foam
741	C	42	140	FA		25/75	10.5	PO	Tire cord dip, adhesives, small particle size for impregnations
781		42	20	RA			10.5	PO	Butadiene-styrene-vinyl pyridine terpolymer with 70/15/15 ratio. Adhesives for synthetic fibers
Tylac									
410		54		Syn. AI	46		10.0	IL	General-purpose latex
420		54		Syn. AI	46		10.0	IL	General-purpose latex
450A		42		Syn. AI	46		10.0	IL	General-purpose latex
3040		49		Syn. AI	46		9.0	IL	General-purpose latex
3340		54		Syn. AI	56		10.0	IL	General-purpose latex
3500		48					9.0	IL	Modified latex for paper coating

Chloroprene (CR)

Code No.	% Solids	Sp. Gr.	pH†	Producer	Description
Neoprene					
Type 60	59	1.12	10.5	DP	Concentrated. Chiefly for foam
Type 400	50	1.15	12.5	DP	General purpose for high modulus, good heat and ozone resistance, and improved tear strength
Type 571	50	1.10	12.2	DP	General purpose
Type 572	50	1.11	12.2	DP	Adhesives. High wet strength
Type 601-A	59	1.12	12.2	DP	Concentrated. General purpose
Type 635	58	1.12	12.2	DP	Concentrated. Blends with other CR latices to improve wet gel strength of films. Paper pulp additive
Type 650	60	1.13	12.9	DP	Concentrated form of Type 750. General purpose where high solids desired. For dipped goods
Type 735	37.5	1.08	12.2	DP	Blends with other CR latices to improve wet gel strength of films. Paper pulp additive
Type 736	34.5	1.06	12.4	DP	Specially stabilized for paper pulp addition
Type 750	50	1.10	12.5	DP	General purpose. Low modulus and excellent crystallization resistance in dipped goods
Type 842-A	50	1.10	12.2	DP	Products do not stiffen at low temperature
Type 950	50	1.10	9.3	DP	Cationic latex. For treatment of fibrous materials

Fluorocarbon

KEL-F Elastomer	An off-white latex form of the copolymer of chlorotrifluorethylene and vinylidene fluoride. Sp. gr. of elastomer, 1.85. Resists strong oxidizing and mineral acids and many synthetic fuels and oils at high temperature. Producer, Minnesota Mining & Mfg. Co., chemical division.

Isobutylene-Isoprene (IIR)

Enjay Butyl	High solids, odorless, water emulsion with excellent freeze-thaw, mechanical and chemical stability. Has inherent characteristics of butyl rubber. Superior gloss, brightness, softness, and lasting flexibility for paper coating, textile finishing, and emulsion paints. It accepts pigments, fillers, thickeners, and tackifiers and is compatible with many resin and elastomer emulsions. Producer, E.

Nitrile-Butadiene (NBR)

Code No.	Type	% Solids	MV	Stab. or Emul.	Anti-oxidants	N/B Ratio	pH	Producer	Description
Chemigum									
235CHS	H	42.5		Syn. AI	NS	45/55	9.0	GT	Non-woven fabrics, textile inks, and leather treatment
236	H	40		Spec. soap	NS	45/55	10.0	GT	Paper impregnation, leather finishing, textile inks, paper saturation, and leather treatment
245B	H	32.5		Syn. AI	NS	33/67	11.0	GT	Impregnation of paper
245CHS	H	42.5		Syn. AI	NS	33/67	9.0	GT	Carpet backings, paper and textile coatings
246	H	40		Spec. soap	NS	33/67	10.0	GT	Impregnation, coating, and saturation of papers
247	H	42.5		Syn. AI	NS	33/67	9.0	GT	Carpet backings, paper and textile coatings
248	H	55		Syn. AI	NS	33/67	9.0	GT	Carpet backings, adhesives, and fabric coatings
Hycar									
1500 x 290		62				Low	9.5	GC	Foam and sponge
1551		52				High	9.5	GC	Adhesives, oil resistant coatings, leather finishes, resin modification
1552		53				Med.	9.0	GC	Adhesives, calkings, coatings, binders
1561		41				High	9.5	GC	Adhesives, abrasion-resistant coatings, leather finishes, binders, resin modification
1562		41				Med.	9.5	GC	Adhesives, finishes, binders, resin modification
1562 x 103		40				Med.	9.5	GC	Adhesives, paper saturation and wet-end addition, textile finishes

† Values indicated are initial pH and may decline slightly on aging.

NITRILE-BUTADIENE (NBR) (*Continued*)

Code No.	Type	% Solids	MV	Stab. or Emul.	Anti-oxidants	N/B Ratio	pH	Producer	Description
Hycar									
1571		41				High	8.0	GC	Adhesives, grease and oil-resistant coatings, finishes, binders, resin modification
1572		50				Med.	6.5	GC	Adhesives, finishes, binders, coatings, resin modification, paper saturation and wet-end addition
1577		40				Med.	9.5	GC	Water and grease-proof coatings, leather finishes, paints, paper coatings and saturation
1872		40				Med.	8.5	GC	Same uses as 1572
1877		40				Med.	9.5	GC	Same uses as 1577
Marbon									
15330		50	75	AI		Med.	8.5	MC	Textile coatings, saturants, adhesives
					%Bd. Sty.	% Bd. AN			
Nitrex									
2612	H	50	90	FA	10	28	10.0	NC	Bu., sty., AN terpolymer. Low water absorption. Leather finishing, beater addition, saturation, and plasticizer for resin latices
2616	H	42	70			High	10.5	NC	Small particles. Excellent bonding and water resistance. Non-woven fabrics, leather, and beater addition
2620	H	42	70				10.5	NC	Small particles. Good bond and tensile. For saturated papers
2625	H	48	135	RA	29	33	10.0	NC	Bu., sty., AN terpolymer. Self-curing. For coating, leather finishing, and reinforcing agent
J-6849	H	62	150				10.5	NC	NBR equivalent of SBR 2105 for oil-resistant foam
Polysar									
XPRD-845	C	64		FA		20/80	10.3	PO	High solids, oil-resistant foam, and adhesives
Tylac									
640		41		Syn. AI			8.5	IL	Textile, carpet, non-woven fabric, and adhesives
650		41		Syn. AI			8.5	IL	Same uses as 640
750		41		Syn. AI			8.5	IL	Same uses as 640
850		41		Syn. AI			8.5	IL	Same uses as 640
1640		41		Syn. AI			8.5	IL	Same uses as 640
1650		41		Syn. AI			8.5	IL	Same uses as 640

Poor Pigment Dispersion

(Continued from page 62)

ing temperatures, and its dispersion is only fair when mixed in the absence of acidic material.

Dispersion by Rubber Types

In order to determine the possible effect of different kinds of rubber on the dispersion of zinc oxide and stearic acid added together, several types of synthetic rubbers were used in Banbury mixing tests in which the conditions and procedure were the same as those previously stated, except for the variation in dump temperatures. One grade of NBR (nitrile) and one of IIR (butyl) rubber, two grades of CR (neoprene) and two grades of SBR were used in this work. The formulation consisted of 100 parts of rubber, five parts of zinc oxide, and two parts of stearic acid.

Both grades of CR scorched badly, and the batch came out of the Banbury in crumbs. With both the NBR (Chemigum N 600) and with SBR 1502 the dispersion of zinc oxide was satisfactory, which may be due to the greater stiffness of these rubbers and the resultant higher shear during mixing and/or the higher temperatures reached during the mixing (Table 8). Poor dispersion was obtained with Enjay Butyl 365 and SBR 1712.

Sculpture Casting Uses Rubber Molds

Greater detail, ability to be reused, and room temperature curing make polysulfide rubber molds useful in casting statues

POLYSULFIDE rubber molds are replacing conventional plaster molds in some applications of sculpture casting. The rubber molds can more faithfully reproduce the minute details of a piece of sculpture such as surface features or complex textures. Also, in large applications where more than one reproduction is required, rubber molds may be especially economical.

For example, a statue of St. Anthony, created for the Seminary of St. Pius X at Graymoor, Garrison, N. Y., contained numerous deep undercuts which would have been impossible to reproduce in a non-flexible medium such as plaster.

Mold Built Over Model

Randolph Plastics, Catskill, N. Y., the mold-maker, built a rubber mold directly over the original model in place of a plaster waste mold. The mold was made from Smooth-On FMC (flexible mold) compounds developed by Smooth-On Mfg. Co., Jersey City, N. J.

The model was divided into four sections: front, back, and two hands, with the back section designed with a large window through which technicians could work in joining the two halves when the time came to fabricate the cast.

FMC 201 (a flexible black compound) was then painted on the model in a thin layer to avoid excess drainage. When it had set, a second layer of non-black rubber was added, this time sufficiently thickened with Cab-O-Sil (Cabot Corp.) to prevent sagging.

First layer of mold compound being applied

After the second layer had set, properly thickened compound was mixed with a slightly thickened fresh mix to produce a putty, which was troweled into the undercuts so that the jacket for the mold could be made with fewer pieces.

Mold Is Reinforced

As soon as another layer of rubber had been painted on, the entire model was covered with overlapping burlap cut into squares and rectangles, thus giving body to the mold. To make the mold easier to handle, milled fiberglass and asbestos were then mixed with thickened compound and puttied along all of the reinforced area to form a triangular-shaped seam, heavy at the base, but tapering to a feather edge along the top. The compounds were then painted over the entire model to cover all the burlap that might grip the jacket.

The jacket was made section by section, solidly reinforced to create solid bracings at points where it would be subject to greatest strain. Pipe reinforcing was then added to complete the mold.

The jacket, which served as reinforcement, was removed by blowing compressed air between the rubber and the jacket. Holes had been drilled through the jacket at strategic points to permit this blowing action. Once suction was broken, the jacket was readily removed from the rubber model.

After a thorough scrubbing with kerosene, which was followed by an acetone wash, the mold was then ready for use in casting.

The original model of the statue is at the right; the finished plaster version in the center. At either side of the plaster statue are the two major parts of the jacketed mold from which the plaster was cast

ASTM D-11 at Cincinnati Completes Work On New Methods; Changes Some Assignments

Committee D-11 on Rubber and Rubber-Like Materials of the American Society for Testing Materials met with the parent Society the week of January 30 at the Netherland Hilton Hotel, Cincinnati, O. The D-11 meeting was held the afternoon of February 3 and was preceded by meetings of subcommittees on February 1 and 2 and the morning of February 3. The Committee D-11 dinner, held February 2, attracted 55 members and guests.

D-11 Meeting

D-11 Chairman Simon Collier presided during the first part of this meeting, and Vice Chairman H. G. Bimmerman, E. I. du Pont de Nemours & Co., Inc., during the latter part; both were assisted by J. J. Allen, Firestone Tire & Rubber Co., D-11 secretary.

Manufacturers of rubberized curled hair requested Committee D-11 to undertake work on the preparation of test methods and specifications for their product in order to introduce some standarization in this industry. Although this product is not strictly a flexible cellular rubber product, it is used in cushioning, and subcommittee 22 has agreed to establish a task group for this work if interested persons from the rubberized curled hair industry will join the subcommittee and assist in the work.

Regular ASTM numbers assigned to new SBR dry polymers and latices in D 1419-60T, Recommended Practice for Description of Types of Styrene-Butadiene Rubbers (SBR) and Butadiene Rubbers (BR), and D 1420-59T, Recommended Practice for Description of Types of Styrene-Butadiene Rubbers (SBR) and Butadiene Rubber (BR) Latices, will not be letter-balloted on each occasion as in the past. ASTM headquarters will consider the addition of these numbers as editorial changes and automatically add them to the tables in D 1419 and D 1420 whenever new printings are made. The new numbers will be publicized as before in the ASTM monthly publication, *Materials Research and Standards* (formerly the *ASTM Bulletin*), and in *Rubber Age* and RUBBER WORLD. All the new numbers assigned during a given 12-month period will be included in the D-11 annual report which is letter-balloted for approval by D-11.

Items recommended for letter-ballot in Committee D-11 by the various subcommittees included new specifications for rubber rings for asbestos cement pipe, new methods for tensile testing at high temperature, a new constant deflection for compression set testing, methods for free and total MBT in MBTS, methods for determining nitrogen in natural rubber and the color of SBR, methods for determining wire cord adhesion, and revised definitions for rubber and elastomer.

The responsibiilty for work on abrasion has been transferred from subcommittee 10 on physical testing to subcommittee 15 on life tests.

It was announced that G. H. Barnes, Goodyear Tire & Rubber Co., has found it necessary to resign as chairman of subcommittee 7 on Rubber Latices. He will be replaced by T. H. Rogers, of the same company. A new committee, E-19 on Gas Chromatography, has been established by the Society, and W. P. Tyler, B. F. Goodrich Co., has been assigned as the official D-11 representative on this committee.

Subcommittee 10 on Physical Testing has been requested to prepare methods of test for tensile strength and compression set of vulcanized rubber after exposure to nuclear radiation, but it was decided not to undertake such work at present. Some results of work in this field have been published;[1] these are considered adequate information for the time being.

Committee D-11 will next meet in Atlantic City, N. J., June 28-30. It may be necessary, however for some subcommittees to meet on June 27.

Subcommittee Reports

Subcommittee 5—Insulated Wire and Cable Co., chairman. Interim reports were received on the temperature correction factor for polyethylene, correlation and simplification of test conditions, classification of rubber compounds, new specifications for poly (vinyl chloride) compounds, and revision of specifications for polyethylene and for silicone rubber. It is hoped that final reports on these items will be available at the June meeting.

Subcommittee 6—Packings. R. F. Anderson, B. F. Goodrich Co., chairman. Revisions to D 1147-59T, Compressibility and Recovery of Gasket Materials, concerning sample thickness and the conditioning procedure in Table 1, together with the addition of a column to Table 1 to show total load in psi., will be recommended for letter-ballot in Committee D-11.

The Proposed Tentative Specification for Rubber Rings for Asbestos Cement Pipe was recommended for letter-ballot in Committee D-11 after revisions of the oven aging period, the low temperature test method, and the compression set procedure.

H. G. Gillette, Precision Rubber Products Corp., presented a paper, "The Need for a Standard Method for Oil Aging of O-Rings." A task group headed by Mr. Gillette was appointed to develop a method for the oil immersion testing of O-rings and to consider the development of an overall O-ring specification.

The sealability procedure developed by Section X of the SAE-ASTM Technical Committee on Automotive Rubber will be considered at its next meeting by subcommittee 6 for use as an ASTM method.

A discussion of cyclic compression stress relaxation and sealability was held, and a study will be made in an attempt to coordinate the activities of the several committees interested in these subjects.

Subcommittee 8—Nomenclature and Definitions. R. G. Seaman, RUBBER WORLD, chairman. The subcommittee chairman reviewed the actions taken at the June, 1960, meeting, at which time the definitions for "rubber," "rubber-like," and "rubber products" were approved for submission to the Administrative Committee on Standards for inclusion in D 1566-58T, Definitions of Terms Relating to Rubber and Rubber-Like Materials. The Standards Committee in September, 1960, accepted the definitions for "rubber" and "rubber products" and rejected the definition for "rubber-like." The D-11/D-20 Joint Task Group on Definitions made a further editorial revision in the definition for "rubber" and developed a definition for "elastomer," at a meeting on December 9, 1960. These definitions were recommended for approval by Committees D-11 and D-20.

[1] RUBBER WORLD, Dec., 1960, p. 75.

H. G. Bimmerman, chairman of task group 1 of subcommittee 8, presented the D-11/D-20 Joint Task Group definition for "rubber" in comparison with the published D 1566 version. It was voted to replace the word "polymeric" with "elastomeric" in the D-11/D-20 rubber definition. The D-11/D-20 definition for "elastomer" was accepted with but one negative vote.

W. H. Watson, Polymer Corp., Ltd., presented a proposal for changing the % retraction after extension in the rubber definition from 10 to 50, in order to include new rubber materials that would otherwise be classified inaccurately as plastics. This change was accepted with only one negative vote being registered, and the latest revision of the definition for "rubber" and the definition for "elastomer" will be letter-balloted in Committee D-11. The Joint D-11/D-20 Task Group on Definitions will be notified of the further D-11 revisions of the "rubber" definition.

The chairman of subcommittee 8 will inform the convenor of the ISO/TC 45 Working Group on Terminology of the status of definitions for "rubber," "elastomer," and "rubber products" in advance of the May, 1961, meeting of ISO/TC 45 in Milan, Italy.

It was voted that task group 1 review the terms in ASTM Special Technical Publication No. 184, "Glossary of Terms Relating to Rubber and Rubber-Like Materials," and offer for inclusion in D 1566 only those terms pertinent to Committee D-11 work.

R. D. Stiehler, National Bureau of Standards, chairman of task group 2, recommended the following codings for the "M" or polymethylene family of elastomers in D 1418-58T, Recommended Practice for Nomenclature for Synthetic Elastomers and Latices:

IM	Polyisobutene
EPM	Ethylene-propylene copolymer
CSM	Chloro-sulfonyl-polyethylene
CFM	Polychlorotrifluoroethylene
FPM	Vinylidene fluoride and hexafluoropropylene copolymer
ACM	Ethyl acrylate and 2-chloroethyl vinyl ether copolymer
ANM	Ethyl or butyl acrylate and acrylonitrile copolymer

It was voted to recommend these codings to D-11 for letter-ballot for inclusion in D 1418-58T.

A résumé of the work of subcommittee 8 since June, 1957, was distributed by the chairman.

Subcommittee 9—Insulating Tape. W. H. Meade, Boston Edison Co., chairman. Tentative limits for moisture resistance in D 1373-59T, Specifications for Ozone Resistant Insulating Tape, will be letter-balloted in the subcommittee before the June meeting.

Tentative test limits for the various physical and electrical characteristics for the proposed specification for butyl rubber insulating tape were discussed. Samples of such tape will be prepared by some manufacturers and subjected to test to accumulate data for comparison with the tentative test limits; then an attempt will be made to establish the proper specifications.

Tack and adhesion tests in D 69-59T, Spec. for Friction Tape for General Use for Electrical Purposes, were discussd, but no action was taken.

Subcommittee 10—Physical Tests. L. V. Cooper of Firestone, chairman. The subcommittee recommended to Committee D-11 the following action on methods under its jurisdiction: D 575-46, Compression-Deflection Characteristics of Vulcanized Rubber, retain as standard; D 676-59T, Indentation of Rubber by Means of a Durometer, retain as tentative; D 1390-56T, Stress Relaxation of Vulcanized Rubber in Compression, retain as tentative; D 1415-56T, International Standard Hardness of Vulcanized Natural and Synthetic Rubbers, retain as tentative; D 1456-57T, Strain Testing of Vulcanized Rubber, advance to standard; and D 1630-59T, Abrasion Resistance of Rubber Soles and Heels, retain as tentative.

Combination of D 1414-56T, Tension Testing of Rubber O-Rings, with D 412-51T, Tension Testing of Vulcanized Rubber, was made unnecessary by the action of the advisory subcommittee of D-11 in transferring D 1414 to subcommittee 6. D 412 will be rewritten with no reference to testing O-rings, but testing by means of "ring test specimens" will be included.

The use of fully molded specimens as well as died-out specimens in D 395-55, Compression Set of Vulcanized Rubber, was approved by the most recent D-11 letter-ballot. One negative vote on the revision of D 412-51T to include the use of strain gages as the recording device for tension testing was resolved at the February 2 meeting.

Discussion of the objections to a modification of D 412 to provide for tensile tests at higher than room temperatures resulted in the request for a letter-ballot in D-11 on the revised method.

The task group on tear testing reported on an interlaboratory test program aimed at determining if the "trousers" type tear test specimen, as used by workers at the Natural Rubber Producers Research Association, should be included in the ASTM tear test method D 624-54. The results were sufficiently encouraging to have the task group prepare a tentative method for the determination of the tear resistance of vulcanized rubber, using the "trousers"-type test specimen.

The task group on compression set testing, headed by W. H. King, Acushnet Process Co., submitted a comprehensive report on D 395-55, Method B, which showed that for 11 commercial synthetic rubbers and natural rubber varying the % deflection with the hardness of the specimen being tested, as prescribed in D 395-55, was not necessary. The task group was requested to prepare a revision of D 395-55, Method B, in which the table of % deflection to be used for specimens of different hardnesses be replaced by a recommendation that 25% deflection be used for all specimens. This revision will then be submitted to letter-ballot in D-11. The subcommittee requested Mr. King to prepare the report for publication in *Materials Research and Standards.*

The request of subcommittee 2 on Radiation Induced Changes in Materials of Committee E-10 on Radioisotopes and Radiation Effects, that D 395 and D 412 be modified to allow for the testing of irradiated samples, was tabled on the advice of D-11's advisory subcommittee, who considered such action premature. A task group under John Born of Goodrich and D-11 representative on E-10, will, however, investigate the matter further.

R. D. Stiehler reported on the work of his task group which had compared hardness values, as determined by D 1415-56T, with those determined with the micro-hardness test method being investigated in ISO/TC 45. Since the results obtained by the two methods showed reasonable agreement, the task group was instructed to prepare a micro-hardness testing procedure for inclusion in D 1415.

Subcommittee 11—Chemical Analysis of Rubber Products. W. P. Tyler, of Goodrich, chairman. Subcommittee 11 voted to propose to subcommittee 12 on Crude Natural Rubber and presumably to ISO/TC 45, Working Group A, that the macro-Kjeldahl method for determining nitrogen in nitrogen-containing polymers in D 297-60T, Chemical Analysis of Rubber Products, be used for the determination of nitrogen in crude natural rubber.

A tested procedure for the determination of free MBT in MBTS, as proposed by the task group on rubber chemicals, was recommended for retroactive letter-ballot in D-11.

A method for the determination of total MBT in MBTS is also recommended for retroactive letter-ballot in D-11.

The negative vote in D-11 on the proposed tentative method for the determination of the specific gravity of rubber chemicals by John E. Smith, J. M. Huber Corp., was discussed and Mr. Smith convinced subcommittee members present that the method does not measure apparent specific gravity of these materials in rubber. The negative vote was withdrawn with the stipulation that the scope of the proposed method be altered to be consistent with the facts, and that the subcommittee study another method for the determination of apparent specific gravity of rubber chemicals when incorporated in vulcanized or unvulcanized rubber. The subcommittee approved this stipulation.

As the result of reports on testing programs for the determination of bound styrene in SBR and of IIR (butyl rubber) in rubber products, a letter-ballot in the subcommittee will be made after minor revisions of the methods. There is a possibility of submitting the methods to D-11 for inclusion in the annual report.

A task group met immediately after the meeting of the subcommittee to discuss methods for the determination of preservatives in natural rubber latex, and the methods discussed will be recommended to subcommittee 7 on Rubber Latices for consideration. The task group agreed also on the necessity of formally requesting assistance from subcommittee 28 on Statistical Quality Control on definitions and statements of repeatability and reproducibility values for methods of chemical analysis.

Subcommittee 12—Crude Natural Rubber. L. G. Mason, of Goodrich, chairman. The subcommittee 12 letter-ballot on the revision of D 1278-58T, Chemical Analysis of Natural Rubber, produced five negative votes, four of which were resolved. The letter-ballot in D-11 produced one negative vote, which was resolved by an editorial revision specifying the use of only a new smooth silica or Vycoor crucible for the determinations of copper and manganese, and with the understanding that Dr. Tyler appoint a task group in subcommittee 11 to study further the use of porcelain crucibles for these determinations.

Dr. Tyler reported that subcommittee 11 is recommending the present nitrogen determination procedure in revised D 297,

with a change in sample size, for inclusion in D 1278 for the determination of nitrogen in crude natural rubber. This procedure will be letter-balloted in subcommittee 12 and Committee D-11, so that, if approved, it may be recommended to ISO/TC 45.

Dr. Tyler reported also that the British Standards Institution has advised discontinuing work on the Draft ISO/TC 45 Proposal for the Determination of Rubber Hydrocarbon in Crude Natural Rubber because of poor reproducibility of results. This poor reproducibility was thought to be due to lack of adequate instructions on sample preparation, but the present difficulties appear to be due to the use of highly purified rubber which oxidizes quite easily. Further work will probably be done on regular grades of natural rubber.

The international interlaboratory cross-check on the physical testing of crude natural rubber of eight different curing rates lacks reports from six laboratories in Europe, one in the Far East, and one in the United States. Data presently available will be analyzed, however, so that a preliminary report can be made at the May ISO/TC 45 meeting in Milan.

The subcommittee chairman read a letter from J. Le Bras, of the French Rubber Institute, regarding samples of MT-60, a specially prepared natural rubber received for evaluation. This rubber was reported to be fast-curing, and tests by Goodrich in the D 15-59T natural rubber 1A recipe confirmed this fact. After the results of tests of other laboratories in this country are obtained, a report will be made to Dr. Le Bras.

H. C. Bugbee, president, and Ralph F. Wolf, director of technical service, of the Natural Rubber Bureau, reported on the latest developments from the Malayan Natural Rubber Producers Research Association laboratories in England and Malaya. An attempt is being made to develop oil-extended and oil-black masterbatches of natural rubber, and samples may be available within a few months. Technically Classified Rubber in any grade will be made available if the demand warrants.

The scope of the task group under I. D. Patterson of Goodyear, on chemical and physical tests for natural rubber was extended to include all grades instead of only No. 1 RSS and No. 1 pale crepe. It was pointed out that the present International Specifications for copper and manganese content, while satisfactory for the higher grades, are not very realistic for the lower grades of natural rubber.

The Rubber Manufacturers Association's Crude Rubber Committee has requested our liaison contact, C. J. Glaser, Lee Rubber & Tire Corp., to head a task group to investigate and make recommendations regarding storage conditions and possible coatings for the International Type Samples of natural rubber that will insure the character and the color of these samples remaining as constant as possible. Whatever method or materials are used, they should have no effect on general appearance, color, moisture content, etc. of the samples and should strongly inhibit or stop changes in these characteristics with time and should not interfere with detailed examination (handling, viewing by transmitted light, etc.) of the samples, while retaining their effectiveness as protective materials. Mr. Glaser will welcome comments and suggestions in connection with this problem.

The development of faster test methods, such as polarographic or X-ray fluorescence methods, for copper and manganese, instead of the present D 1278 methods, has not made much progress. Dr. Tyler reported that the polarographic method might be as slow or slower than the colorimetric methods now in use, and the expensive equipment required would be found in only a few laboratories. X-ray fluorescent methods are still to be investigated.

Subcommittee 13—Synthetic Elastomers. B. S. Garvey, Jr., Pennsalt Chemicals Corp., chairman. L. G. Mason, chairman of task group 1 on sampling reported he was investigating an instrument of Hydrodynamics, Inc., Division of American Instrument Co., for the determination of moisture in carbon black masterbatches. Samples will be sent to Hydrodynamic for analysis.

E. J. O'Connor, Goodrich-Gulf Chemicals, Inc., chairman of task group 2 on chemical tests, reported that three of the four negative votes in the subcommittee 13 letter-ballot on the proposed method for the determination of the color of raw rubber were resolved by editorial changes. It was voted (one negative) to submit the method with the editorial changes to letter-ballot in Committee D-11.

Thirteen persons indicated interest in working with task group 2 on modification of the procedure for the determination of the gel content of SBR, with the object of developing a standard method of test.

H. R. Norsworthy, Texas-U. S. Chemical Corp., of task group 3 on physical tests, reported that the test recipes for SBR black and oil-black masterbatches, when completed, can probably be used for testing unpigmented and oil-free SBR. It was voted (one negative) that the four recipes given the table below were accepted in principle for cross-tests among interested laboratories in order to determine the MBTS accelerator ratios before submission to letter-ballot in D-11 by June, 1961.

TABLE III—STANDARD FORMULAS FOR SBR FURNACE BLACK AND OIL-FURNACE BLACK COMPOUNDS

		14 phr Oil or Less		More Than 14 phr Oil	
		Rosin Acid or Mixed Acid	Fatty Acid	Rosin Acid or Mixed Acid	Fatty Acid
Compound No.		1C	2C	3C	4C
Ingredient	NBS Std. Sample No.				
Masterbatch	—	100 + X + Y	100 + X + Y	100 + X + Y	100 + X + Y
Zinc oxide	370	3.0	3.0	3.0	3.0
Sulfur	371	2.0	2.0	3.0	3.0
Stearic acid	372	1.5	—	1.5	—
Benzothiazyl disulfide	373	?	?	?	?

X = parts carbon black per 100 SBR base polymer.
Y = parts oil per 100 SBR base polymer.
Batch Size: Use formula multiplier of 2 to 4 in increments of 0.5 to give as large a total batch weight as possible that will not exceed 700 gms.

I. D. Patterson, chairman of task group 4 on latices, proposed the addition of the following sentence to item 8 (a) of D 1417-59T, Tests for Synthetic Rubber Latices: "The surface tension of styrene-butadiene rubber latex shall be determined on total solids as received unless the viscosity is greater than 200 centipoise units on No. 1 spindle at 20 rpm, in which case dilute the strained latex with distilled water to 40 ± 1% total solids content." It was voted to submit this proposal to letter-ballot in D-11.

It was also voted to add the following to item 10 (c) of D 1417: "Clean the stainless steel screen by burning."

In accordance with a recommendation from the synthetic rubber latex producers and the advisory subcommittee of D-11, it was voted that the work on synthetic rubber latices remain in a task group of subcommittee 13 and not be transferred to subcommittee 7.

It was also voted to submit to letter-ballot in D-11 the following note as an addition to D 1419-60T, Description of Types of Styrene and Butadiene Rubbers: "Oils described as types in Table II can be tested by the following methods: D 92-57, Flash and Fire Points by Cleveland Open Cup; D 97-57, Cloud and Pour Points; D 88-56, Saybolt Viscosity or D 445-53T, Kinematic Viscosity; D 611-55T, Aniline Point and Mixed Aniline Point; D 972-56, Evaporation Loss of Lubricating Greases and Oils; D 974-58T, Neutralization Value (Acid and Base Numbers); D 1298-55, Specific Gravity; and D 1500-58T, Color."

Three negative votes were registered in the subcommittee 13 letter-ballot of October, 1960, against the change in abbreviations for extender oils used in Table II of D 1419, all because there is no ASTM method for the determination of % saturates by weight. W. J. Yates, Shell Oil Co., and secretary of the new D-2/D-11 Joint Task Group on Extender Oils, reported on a program for cross-checks on six such oils to be conducted among nine laboratories, to be completed in time to submit a proposed method for extender oils by the June, 1961, meeting.

New numbers assigned to dry and latex SBR's in D 1419 and D 1420, respectively, by the subcommittee 13 task group headed by Dr. Garvey will not be letter-balloted in D-11 each time as in the past. Notice of the new numbers will be sent to ASTM and to the rubber trade publications approximately 15 days after assignment by the D-11 secretary. This action has the approval of the D-11 advisory subcommittee and of the members of subcommittee 13 and has tentative ASTM headquarters approval. New numbers will be included in each D-11 annual report which is letter-balloted once each year in D-11.

It was voted that the chairman of subcommittee 13 appoint a task group of not more than five members for the purpose of establishing ground rules for the assignment of SBR numbers in ASTM for domestic as well as foreign grades and to consider number systems for SBR and other synthetic rubbers for use on a national as well as international basis. Objections to the continued use of the ASTM numbering system for SBR on an international basis have been raised in ISO/TC 45 by two countries abroad.

Subcommittee Chairman Garvey explained the activities and position of ISO/TC 45 Working Group C on Natural and Synthetic Rubbers and its relation to subcommittee 13 and D-11. The BSI proposal to ISO/TC 45 for the development of specifications and test methods for SBR 1500 and 1712 was mentioned.

D 1206-52T, Resistance to Aging of Vulcanized Rubber by Measurement of Creep, will remain as tentative. SAE/ASTM Technical Committee on Automotive Rubber is working on stress relaxation and creep, and Mr. Maassen will contact this SAE/ASTM committee to determine the status of its work and how it might relate to D 1206; then a further review will be made of D 1206.

D 454-53, Air-Pressure Heat Test of Vulcanized Rubber, will remain as standard.

D 572-53, Accelerated Aging of Vulcanized Rubber by the Oxygen-Pressure Method, will remain as standard. It was voted, however, that paragraph 4(h) be expanded to read, "No copper or brass parts shall be exposed to the atmosphere of the pressure chamber or in the tubing or valves leading to it," since it was felt that copper or brass parts may contribute to erroneous results.

D 573-53, Accelerated Aging of Vulcanized Rubber by the Oven Method, will remain as standard until approval for the "Tentative Method of Test for Tubular Oven Aging of Elastomers and Plastics," proposed by G. N. Vacca, Bell Telephone Laboratories, chairman of the task group on oven aging, is obtained from simultaneous letter-ballot in subcommittee 13 and D-11. This task group reported that round-robins tests showed that results using the tubular (Apex) oven were more reproducible than those obtained using ovens currently specified. Subsequently, the use of the tubular oven will be submitted to Committee E-1 for approval.

A. G. Veith, Goodrich, chairman of the task group on ozone testing, reported that a round-robin on ozone testing is in progress in which ISO/TC 45 is also active, but that no results are ready for reporting as yet.

It was voted to add to paragraph (4)(b)(2) of D 1171-59, Weather Resistance Exposure of Automotive Rubber Compounds, the statement, ". . . or they may be exposed in a cabinet in which the ozone concentration is controlled, as described in D 1149," following the phrase, ". . . as shown in Figure 2."

D 518-57T, Resistance to Surface Cracking of Stretched Rubber Compounds, states in paragraphs 4(a) and 8(a) that specimens "shall be cut longitudinally from standard laboratory test slabs," and paragraph 12(a) indicates no direction. Since standard best slabs measure 6 by 6 inches, there is no longitudinal direction. It was voted to revise paragraphs 4(a), 8(a), and 12(a), as follows:

"4(a) The test specimens shall be rectangular strips one inch in width by six inches in length cut from standard laboratory test slabs having a thickness of 0.075 of an inch minimum and 0.100 of an inch maximum so that the grain will be running in the lengthwise direction of the specimen."

"8(a) The test specimens shall be rectangular strips one inch in width by 3¾ inches in length cut from standard laboratory test slabs having a thickness of 0.075 of an inch minimum and 0.100 of an inch maximum so that the grain will be running in the lengthwise direction of the specimen."

"12(a) The test specimens shall be die-cut tapered strips having outside dimensions as shown in Fig. 4, cut from standard laboratory test slabs having a thickness of 0.075 of an inch minimum and 0.100 of an inch maximum so that the grain will be running in the lengthwise direction of the specimen."

The D-11 advisory subcommittee has assigned abrasion tests to subcommittee 15, which follows policy of ISO/TC 45 where abrasion tests are the responsibility of the Working Group on Degradation. D 1630-59T, Abrasion Resistance of Rubber Soles and Heels, will remain tentative because of work now in progress.

Mayhew Photographers

Committee D-11 Advisory Committee and guest at their meeting on February 1: *Front row, left to right:* W. A. Frye, L. V. Cooper (ASTM director), R. A. Schatzel (past president ASTM), S. Collier (D-11 chairman), J. J. Allen (D-11 secretary). *Back row, left to right:* B. S. Garvey, Jr., G. C. Maassen, H. G. Bimmerman, (D-11 vice chairman), A. E. Juve, I. D. Patterson, R. G. Seaman, RUBBER WORLD, guest

Subcommittee 15—Life Tests. G. C. Maassen, R. T. Vanderbilt Co., chairman. The subcommittee reviewed the several specifications under its jurisdiction, with special reference to recommendations for any changes in their status.

It was voted to retain D 749-43T, Method of Calibrating a Light Source Used for Accelerating the Deterioration of Rubber, as tentative. J. E. Norton, Atlas Electrical Devices Co., chairman of the task group on weathering, reported that the plastic chip method of determining light intensity is satisfactory, and as soon as a sufficient quantity of plastic chips is available, they will be obtainable from the National Bureau of Standards. It is hoped that this problem can be solved in time for a revision of D 749 to be made at the June meeting.

D 750-55T, Resistance to Light Aging of Rubber Compounds, will remain as tentative until the D 749 situation is resolved; then a review of D 750 will again be made.

Subcommittee 16—Description and Classification of Rubber Compounds. J. F. Kerscher, Goodyear, chairman. The proposed draft of ASTM D 2000 or SAE 200J, Classification System for Elastomeric Materials for Automotive Applications, was discussed at length.

The Enjay Co. representative reported his company was in agreement with the system in principle, but had two reservations. First, it was felt that the compression set requirements in Table VI for BA compounds were too strict. The present values of 50% set were valid at the 158 F. conditioning temperature of D 735-59T, Spec. for Elastomeric Compounds for Automotive Applications, but should be relaxed to about 80% if the 212 F. temperature now specified is to be retained.

Second, Enjay requested information on the policy with regard to the second page of the Addendum, e.g., will it be published with the method? Enjay felt that no suggestion of what polymer is used in any call-out should be included in this second page of the Addendum where it might be construed as having official status. The company is opposed to including this page with the publication of the method, but might be agreeable to publication of that portion of the table relating old designations (R, SC, etc.) to the new (AA, BA, etc.).

It was suggested by others, however,

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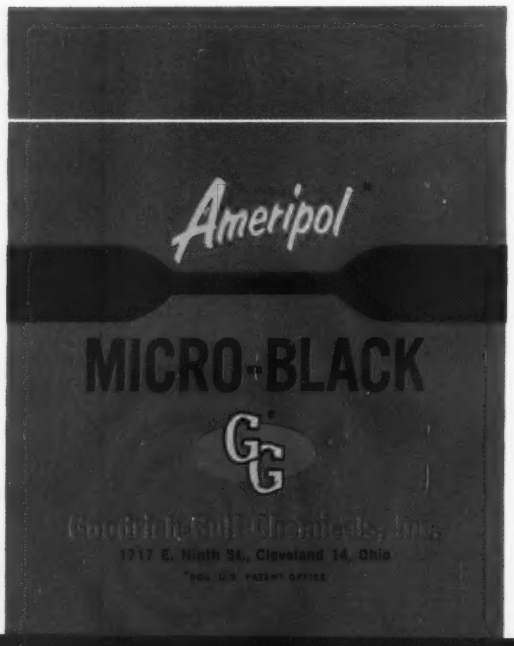

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that perhaps the lack of this second page of the Addendum might cause confusion among the rubber product consumers during the changeover period from D 735 to D 2000 or SAE 200J. Also, this confusion might be avoided if such correlations were circulated by the suppliers to the industry.

Dr. Stiehler registered a complaint against the use of aging and swell for the determination of the prefix in D 2000 and then adding suffixes to modify the same properties. He and others felt that one determination for these two properties should be sufficient. Subcommittee 16 requested the authors of the system to provide an explanation why they set up the system in the present form with regard to the point raised by Dr. Stiehler.

There was a request for more examples, particularly of some of the less standard call-outs, in order to familiarize more people with the system and remove some of the confusion or reservations held by many. It was suggested that these examples might be published in one of the rubber trade journals.

Subcommittee 16 agreed that values for suffix L (water resistance) are required in grades met by NR, SBR, and IIR when used for appliances such as washing machines and in plumbing applications. Several persons promised to supply data for use in determining the proper specifications for the table of suffix L values.

Subcommittee Chairman Kerscher announced that H. Geldof, Convenor of Working Group J on Classification of Vulcanized Rubber of ISO/TC 45, had been requested to delay decision on a classification system until the D 2000-SAE 200J proposal could be considered.

The subcommittee was shown the latest classification system proposal of the Netherlands delegation to ISO/TC 45, but agreed that a system permitting call-outs of impractical compounds was not desirable. More time will be required to study the proposal of the Netherlands delegation before deciding on the attitude of the American delegation.

Subcommittee 20—Adhesion Tests. P. J. Larsen, Lord Mfg. Co., chairman. The use of the Lord conically shaped inserts for testing rubber-to-metal adhesion appears to be sufficiently promising to warrant further investigation, but there will be more study by the subcommittee before extensive work is planned. W. A. Frye, Inland Mfg. Division General Motors Corp., and W. DeCrease, Hughson Chemical Corp. Division, Lord Mfg. Co., will arrange for some testing with these inserts whereby the significance of at least two diameters may be considered in the results obtained. Mr. Frye will also try to present a progress report at the June meeting on dynamic adhesion testing using the conically shaped inserts.

Discussion of angle of pull variation in D 429-58, Method B, Adhesion Testing of Rubber to Metal, and of preenvironmental exposure standardization as a supplement to D 429-58 Method B, resulted in a request for voluntary testing by members of subcommittee 20; data obtained are to be a guide for further discussion at the June meeting.

The subcommittee decided against changing D 429-58, Method B, to comply with Federal Specification 601, Method 8031. A full explanation of this action will be forwarded to Dan Pratt, U. S. Navy, Bureau of Ships.

S. Brams, Dayton Chemical Products Laboratories, Inc., suggested that more emphasis be directed toward standardization of methods for determination of bond values of actual production parts. It was the opinion of the subcommittee that more work should be directed toward determination of specification values so that blueprints of production parts might begin to cover this aspect.

There has been no charge in the status of the work on non-destructive and dynamic testing.

Subcommittee 21—Rubber Cements. J. F. Anderson, Goodrich, chairman. Subcommittee 21 and its task groups, 2A on cord adhesion and 2B on wire cord adhesion, held separate meetings. Separate meetings of these task groups had also been held in Detroit, Mich., on November 10, 1960.

George Harrison, chairman of task group 2A, reported that a specialized version of the "H" pull test faces its fifth revision and will be ready for letter-ballot in subcommittee 21 and Committee D-11 prior to the 1961 annual meeting. Editorial changes and further testing with ¼- by ¼-inch and the ¼- by ⅛-inch molds to resolve the problem of the effect of mold dimensions will be completed soon. Mr. Harrison has asked three members of the subcommittee to work with him in listing and illustrating methods to be considered for standard dynamic testing.

R. H. Hertzog, John A. Roebling's Sons Division, Colorado Fuel & Iron Corp., chairman of task group 2B, reported that "after one and three-quarter years of extensive round-robin testing with various molds . . . pullout tests with two types of molds are ready for standardization after a few editorial revisions." A letter-ballot will be conducted in the subcommittee before February 15, at which time a subsection will resolve any problems prior to submitting a two-part method to letter ballot in D-11, on or after April 5, 1961.

R. E. Dix, representing C. R. Lupton, chairman of task group 1 on structural adhesion and non-destructive testing, reported on a correlation of the progress of the SAE/ASTM Technical Committee on Automotive Rubber and that of subcommittee 21 on methods for testing brake-lining adhesion.

The subcommittee recommended that D 1205-59T, Methods of Testing Adhesives for Brake Lining and Other Friction Materials, be advanced to standard, and that D 553-42, Methods of Test for Viscosity and Total Solids Content of Rubber Cements, and D 816-55, Methods of Testing Rubber Cements, be retained as standard.

A proposal that R. H. Monet and W. I. Martin, of Koppers Co., Inc., present a paper, "Statistical Evaluation of Factors Affecting Adhesion of Cord to Rubber," at the next D-11 meeting was referred to H. G. Bimmerman, D-11 program chairman.

It was suggested also that a timely subject for research is the differentiation between "adhesion" and "bond strength."

Subcommittee 22—Flexible Cellular Materials. H. C. Bimmerman, Du Pont, acting chairman. The subcommittee voted to retain as tentative D 1055-59T, Spec. and Methods of Test for Latex Foam Rubbers; D 1056-59T, Spec. and Methods of Test for Sponge and Expanded Cellular Rubber Products; D 1564-59T, Spec. and Methods of Test for Flexible Urethane Foam; and D 1667-59T, Sponge Made from Closed Cell Poly(Vinyl Chloride), or Copolymers Thereof.

Manufacturers of rubberized curled hair requested the help of D-11 in the development of methods of test and specifications for their products. J. J. Allen, D-11 secretary, stated that the work could probably be done in subcommittee 22 if a group of interested and informed people became members of subcommittee 22 and assisted in the work. Representatives of the rubberized curled hair manufacturers indicated they would probably arrange for such a group to join the subcommittee and would contact its chairman L. A. Wohler, of Firestone.

A requestion for comments on Specification MIL-C-31334 (ORD.) of August 25, 1960, of the Rock Island Arsenal was unsuccessful in that no comments were forthcoming from the subcommittee.

Subcommittee 24—Coated Fabrics. K. L. Keene, United States Rubber Co., chairman. The subcommittee voted to retain as standard D 815-47, Method of Test for Hydrogen Permeability of Rubber Coated Fabrics.

W. H. Bryan, Du Pont, gave a progress report on methods for measuring the cold crack resistance of coated fabrics which indicated the need of more work before a test method can be developed.

The subcommittee chairman gave a progress report on the work to date with the use of the Taber machine for abrasion tests on coated fabrics which indicated inconclusive results and the need of further work.

It was reported that Committee D-13 on Textile Materials is considering the use of a machine called the Acceleroter for determining abrasion resistance. An arrangement was made to make some tests on coated fabrics on this machine.

Subcommittee 25 — Low-Temperature Tests. R. S. Havenhill, St. Joseph Lead Co., chairman. W. H. Bryan reported on the results of the second round-robin series of tests for the low-temperature properties of coated fabrics. The results on four different coated fabrics were obtained using the D 746-57T, Brittleness Temperature of Plastics and Elastomers by Impact apparatus, a hand-operated WAD jig, St. Joe gravity mechanized WAD jig, and the Sperry modified D 746 gravity operated fold test and showed considerable variation and the need of further study of the effects of speed, clearances, and other factors.

The subcommittee voted to advance to standard D 1053-58T, Method of Measuring Low-Temperature Stiffening of Rubber and Rubber-Like Materials by Means of a Torsional Wire Apparatus, with the following changes, which were made at the request of the producers of insulated wire and cable and the NEMA and which resolved the three previous negative D-11 letter-ballots on this method. These changes, which allow the use of molded specimens, follow:

(1) Under "Apparatus," paragraph 2(c), insert between the first and the last sentence, "The color codes for these wires are black, yellow and white, respectively."

(2) Replace paragraph 4 under "Test Specimens" with the following:

"The test specimens shall be cut with

a suitable die and shall be 1.5 ± 0.10 of an inch long and 0.125 ± 0.005 of an inch wide. The standard thickness of the specimen shall be the thickness of the material undergoing test, but shall be within the limits 0.085 ± 0.025 of an inch. The difference between maximum and minimum thickness of each specimen shall not exceed 0.003 of an inch. Values of thickness other than standard may be used, provided it can be shown that they give equivalent results for the material being tested. When specimens taken from the finished article are not of standard thickness, it shall be permissible, upon agreement between customer and supplier, to use a standard sized specimen taken from a certified press cured tensile sheet of the same compound."

The subcommittee voted to retain D 599-55, Method of Test for Physical State of Cure of Vulcanized Rubber, as standard with the following editorial revision: Under "Scope 1," last sentence in left column between the words "to" and "rubber" insert "primarily natural." This addition was made as this method was and still is used to determine the state of cure of natural rubber compounds.

In connection with D 599-55, the letter of H. G. Winters was discussed, and it was voted not to incorporate the use of gaseous heat transfer media in the method owing to difficulties and longer times for the samples to reach thermal equilibrium with gaseous as compared with liquid heat transfer media.

It was voted to retain D 736-54T, Method of Test for Low-Temperature Brittleness of Rubber and Rubber-Like Materials, as tentative since some old specifications still call for the use of this method. It will be replaced by the more accurate D 746-57T in all new specifications.

It was voted to retain D 1229-55, Low-Temperature Compression Set of Vulcanized Elastomers, as standard without change.

Subcommittee 26—Processibility Tests. R. H. Taylor, Scott Testers, Inc., chairman. J. F. Kerscher, Goodyear, chairman of task group 4, reported that differences in extrusions using the No. 1 extrusion die (Garvey type) with different extruders are still found. The task group expects to have accounted for these differences by the June meeting and to have a definite proposal for a test procedure.

N. O. Swennes, American Synthetic Rubber Corp., chairman of task group 5 (Mr. Swennes replaced F. J. Sackfield as chairman), reported that methods for the determination of mill shrinkage of both raw and compounded polymers are ready for letter-ballot in the subcommittee. It was decided to combine the two procedures into one method and to make the procedure for the shrinkage of compounded stock as broad as practical so that the testing of production-type stocks could be included. A task group was appointed to combine the two procedures and make the necessary editorial changes so that the new method conforms to ASTM practices.

G. E. Decker, Monsanto Chemical Co., chairman of task group 1, reported progress in connection with the effect of holding pressures on Mooney viscosity results. Work to date indicates that other variables may be much more important than holding pressures in effecting Mooney viscosity results. A definite recommendation is expected by the meeting in June.

The subcommittee voted to recommend that D 1646-59T, Method of Test for Viscosity and Curing Characteristics of Rubber by the Shearing Disk Viscometer, be advanced to standard with an editorial revision of note 4, section 7(b) to specify the type of cellophane suitable for use with sticky materials and also to recommend a suitable Mylar for the same purpose. W. Rogers, of Du Pont, will supply these recommendations.

Subcommittee 28 — Statistical Quality Control. J. Mandel, National Bureau of Standards, chairman. The subcommittee chairman gave a talk on "Interlaboratory Studies of Test Methods," in which he discussed the design of such a study, the analysis of data, and the interpretation of the results. A question-and-answer period followed this talk.

Subcommittee 11 has requested subcommittee 28 to define repeatability and reproducibility in connection with statements on the precision of test methods for the chemical analysis of rubber and rubber products. Since Committee E-11 on Quality Control of Materials is now considering this problem, the chairman of subcommittee 28 will discuss it with E-11 before making definite recommendations.

It was decided to retain D 1421-56T, Recommended Practice for Interlaboratory Testing of Rubber and Rubber-Like Materials, as tentative. The chairman will appoint a task group to make recommendations for revision.

Subcommittee 29—Compounding Ingredients. A. E. Juve, Goodrich, chairman. The task group for the development of a test recipe and method of testing carbon blacks in SBR, under J. Gifford, Witco Chemical Co., reported that excessive variation in the results from laboratory to laboratory was observed, using a particular base recipe, and that these variations were traced to differences in the moisture content of the carbon blacks used. Further work will be done to develop a procedure or recipe less sensitive to moisture variation.

R. O. Treat, J. M. Huber Corp., chairman of the task group responsible for following the stability of Industry Reference Black No. 1 on aging, reported that there has been no measurable change in this black in the past 18 months. Future checks will be made every six months. J. F. Svetlik, Phillips Chemical Co., reported that a 40,000-pound portion of the lot of IRB No. 1 was carefully rechecked, and on the basis of the results obtained, 5,000 pounds were rejected. The remaining 35,000-pound lot is adequately uniform and should last for over a year. Before it is exhausted a similar check will be made with an additional 40,000-pound lot.

C. W. Sweitzer, Columbian Carbon Co., chairman of the task group on the development of methods for measuring the degree of pigment dispersion in rubbers, stated that the prospects are good for developing a quick and simple procedure and a more refined and more quantitative method for measuring dispersion on vulcanized specimens. Additional work will be required, however, to resolve differences between laboratories in both procedures before methods can be written. Additional work will be required also to develop methods for unvulcanized specimens.

The task group investigating various masterbatch procedures for mixing the natural rubber test recipe for testing carbon blacks in D 1522-58T, Testing Carbon Blacks in Rubber, reported that three different techniques were compared in a round-robin test and that all three gave satisfactory results, although there was no improvement in reproducibility over the mixing of the ingredients separately. The mixing time was reduced with the masterbatch techniques over the mixing of separate ingredients, and it was suggested that in daily operation the masterbatch techniques could be expected to be more reproducible. Some additional work is required before a definite recommendation can be made.

R. B. Knill, Goodyear, chairman of the task group to consider certain objections raised by Enjay Laboratories to the procedures incorporated in D 15-59T for the butyl rubber recipes, reported that a recommendation to solve these difficulties would be made soon.

G. C. Maassen, who has been rewriting D 15-59T, recommended that his present version, amended to incorporate the latest change in D 1522-58T, be submitted to letter-ballot in subcommittee 29.

The subcommittee voted to letter-ballot in D-11 an increase of 125 psi. for the 15-minute cure value and an increase of 150 psi. for the 30-minute cure value for the modulus of GPF black stocks in the Specification for Carbon Blacks.

ISO/TC 45

R. D. Stiehler, chairman of the American Group for ISO TC 45, reported that the next meeting of this committee will be held in Milan, Italy, May 8-13. Any member of Committee D-11 who can be in Italy at this time is requested to contact the chairman of the American Group.

The following ISO TC 45 Recommendations relating to rubber have been issued and are available from the American Standards Association in New York, N. Y.: R 123, Sampling of Latex; R 124, Determination of Total Solids of Latex; R 125, Alkalinity of Latex; R 126, Dry Rubber Content of Latex; and R 127, KOH Number of Latex.

Technical Committee A Report

Summary of the 1960 activities of the SAE/ASTM Technical Committee on Automotive Rubber was given by J. J. Allen in the absence of H. Tangenberg, Tech A secretary.

The work of several sections has resulted in Tech A letter-ballots on the following items, which have been forwarded to the parent societies: (1) A Latex Dipped Goods Specification and Method of Test. (2) Modifications of SAE 10R, Table VI on Polyacrylates. (3) A Specification for Automotive Air-Conditioning Hose. (4) A Method of Test for Urethane Foam. (5) Changes in the Vinyl Foam Specification to Include Flammability.

Items from Tech A letter-ballots which have been referred back to the various sections include a new specification on 30R1, 2, 3, 4 Fuel and Oil Hose, which has been returned to P. Hopkins, Electric Hose & Rubber Co., chairman of subsection IIIE, for changes. An entirely new 30R1 has been prepared replacing the older type, which is obsolete. Modifications of 30R2, 3, and 4 are intended to reflect more recent developments. A new

Rubber Boot Specification for Actuating Hydraulic Brake Cylinders is being returned to R. C. Pocock, chairman of the Automotive Hydraulic Brake Cup Section.

At the March, 1960, meeting, M. Lowman presented a paper on ozone, its effects and methods of test; in June, E. J. Kvet presented a paper on latex dipped goods; in September, E. R. Cole spoke on low-temperature brittleness.

N. L. Catton, T. Loring, and R. Edwards presented their paper, on the new Classification System for Elastomeric Materials for Automotive Applications, before many local rubber groups and similar organizations. In addition, they conducted a panel discussion on this system at the International Congress and Exposition of Automotive Engineering[2] at Cobo Hall, Detroit, Mich., January 9. The work on this new system is progressing well with much of the section IV activity revolving around new values and their placement in the SAE 10R tables. It is hoped that SAE 200 and ASTM D 2000 may be reserved for these new tables.

K. Miller, chairman of section XV on Automotive Suspension Bushings, reports favorable progress on designing and building a new bushing test unit. M. Sidwell's subsection on Ozone has completed its work on the comparability of ozone chambers and has presented its recommendations to ASTM D-11 subcommittee 15.

C. S. Coddington, chairman, subsection IIIB on Coolant Hose, reports changes in SAE 20R on Heater Hose are in progress. R. C. Pocock, chairman of section IX on Automotive Hydraulic Brake Cups, has prepared a Brake Boot Specification which is now being revised in form. Work on stroke testing equipment and a standard test fluid for cup testing are in progress. R. C. Waters' Oil Seal section is actively reviewing a Seal Specification and SAE 110R (Oil Leakage Test). M. H. Kapps is resigning as chairman of the Gasket section, but this very active section is revising ASTM D 1170-59T, Spec. for Nonmetallic Gasket Materials for General Automotive and Aeronautical Purposes, and is remaining active in several other fields relating to gaskets.

[2] RUBBER WORLD, Feb., 1961, p. 92.

Tlargi Hears Jones

The use of Pitt-Consol 646, an odorless peptizer, was discussed by Donald C. Jones of the research and development department of Pitt-Consol Chemical Co., Newark, N. J., at the February 7 meeting of The Los Angeles Rubber Group, Inc.

Approximately 90 persons attended the technical meeting and 300 attended the dinner that followed at the Biltmore Hotel. W. Ball, chairman of personnel for General Motors Corp., dinner speaker, discussed changes in technology that will be made in the future if developments continue at their present rate. Among the possibilities he discussed were manned space flight to distant stars, wrist-type television communicators, and teleportation.

Dr. Jones told the technical meeting that odorless peptizers have been developed from research on reactions of thioxylenols or aromatic mercaptans, sold as Pitt-Consol 640. He said Pitt-Consol 646 is effective in smoked sheet, SBR 1006 and 1502, in masterbatches SBR 1600 and 1803, and in oil-extended SBR's 1703 and 1712. Activity was also observed in polyisoprene, chlorobutyl, and polybutadiene. In Neoprene W and Neoprene WHV, plastication was slight at the normally low milling temperatures for neoprene, but at 310° F. final Mooney viscosities of 25 for Neoprene W and 40 for Neoprene WHV were observed.

The effect of the peptizer on unaged and aged physicals of natural rubber and SBR 1006 was very slight, he added.

The speaker further stated that Pitt-Consol employs a novel and efficient solvent extraction process on spent caustic solution from petroleum refineries to separate phenol, cresols, and xylenols from thiophenol, thiocresols, and thixylenols and is trying to find other new uses for these aryl mercaptans or their derivatives.

Specialty Rubber Course

The Los Angeles Rubber Group will sponsor a new course, "The Technology of Specialty Elastomers," at the University of Southern California this fall. Dr. E. G. Partridge will be instructor for the course, which will explore the chemistry, structure, manufacturing, processing, properties, and application of butyl, neoprene, and nitrile rubbers, "Hypalon," Thiokol, polyurethanes, nitrile-PVC blends, and stereospecific rubbers such as polyisoprene, polybutadiene, and ethylene-propylene rubber.

Fort Wayne Meeting

The Fort Wayne Rubber & Plastics Group held its monthly meeting, February 9, at the Van Orman Hotel, Fort Wayne, Ind. K. A. Erwin, Borg-Warner Corp., Marbon Chemical Division, spoke to the 160 members about "ABS Plastics Properties."

Coatings Conference

The Chemical Institute of Canada's fifteenth annual divisional conference of the Protective Coatings Subject Division was held at the Seaway Hotel, Toronto, Ont., Canada, February 23, and at the Windsor Hotel, Montreal, P.Q., February 24.

The program, which was the same in both cities, covered developments in the protective coatings field in England, Russia, the United States, and Canada. Other topics discussed included fatty vinyl ether copolymers, stereorelugated elastomers, and vinyl polymers.

Ontario Rubber Course

Despite dramatic advances in rubber technology in recent years, scientists have only partially explained the chemical reactions that take place during processing of rubber, Irwin J. Schaffner, a senior research scientist at United States Rubber Co.'s research center at Wayne, N. J., told a class at the Ryerson Institute of Technology, Toronto, Ont., Canada.

Dr. Schaffner spoke on February 22 as guest lecturer on rubber technology under the sponsorship of the Ontario Rubber Group and the Division of Rubber Chemistry, Chemical Institute of Canada.

Researchers have come to understand the biological synthesis of the rubber tree and have learned how to produce a man-made duplicate of natural rubber, he said. Much progress must still be made, however, toward solving the complex chemical reactions of vulcanization, the process that makes rubber a practical material, he added.

CIC Exhibition

Some 8,000 delegates from all over the world are expected to visit the more than 60 chemical displays to be set up in connection with the forty-fourth Canadian Chemical Conference and Exhibition of The Chemical Institute of Canada, to be held August 3 to 5 in the Queen Elizabeth Hotel, Montreal, P.Q., Canada.

Exhibitors will also have an opportunity to display their products and services for an additional two days, August 7 and 8, opening days of the Eighteenth International Congress of Pure and Applied Chemistry.

Ethylene-Propylene

A new ethylene-propylene synthetic rubber which can be sulfur-cured by conventional rubber industry techniques has been developed by E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.

Tests indicate that the polymer is well suited for general-purpose use and appears to have excellent resistance to ozone, weather, and abrasion. It was found also that the new elastomer processes well and can be compounded in a wide range of stable colors.

washington report

By JOHN F. KING

March 6 Additives Deadline Change Likely; FDA Asks Revision of RMA January Petition

The Kennedy Administration has granted a general reprieve to U. S. industry from the March 6 deadline to comply with the 1958 Food Additives Law. But the rubber industry's appeal for a blanket bill of health on a long list of rubber goods used in the food industry still was unanswered in late February.

A meeting between a special committee of The Rubber Manufacturers Association, Inc., and Food & Drug Administration officials on February 21 produced a government request for additional information on the catalog of rubber products RMA wants cleared. E. T. Wulfsberg, Food & Drug Officer for the Department of Health, Education & Welfare, maintained the rubber industry committee still had not proved its case that the list of items submitted contain no harmful food additives. While the industry proposal was not rejected, Wulfsberg asked that the voluminous petition, presented by the RMA committee January 4, be revised and resubmitted.

Despite some feeling among rubber companies that the industry should sit back and let FDA try to enforce the additives law—rather than the industry accepting the burden of proof by trying to demonstrate that rubber products in long use in the food industry are safe—the special committee headed by Edward Welch, of RMA's industrial products division, agreed to revise the petition.

HEW Asks Deadline Extension

One factor in the committee's decision was the request by HEW Secretary Abraham Ribicoff on February 16 for legislation extending the March 6, 1961, deadline for compliance with the additive law. If approved by Congress as expected, the pressure will be off industries to show by that date that their products are not harmful when they are used in the production of food and beverages.

Ribicoff, in a letter to House Commerce Committee Chairman Oren Harris (Dem., Ark.), said he wanted the extension to allow industry additional time "for scientific study and safety clearance" of food additives in commercial use before January 1, 1958. The materials and compounding standards which RMA asked FDA to clear in its January 4 proposal all were in use in the food industry prior to that date.

Ribicoff's request in effect constituted an endorsement of a draft bill sent to Harris's committee on January 13 by Arthur S. Flemming, HEW Secretary under the Eisenhower Administration. The extension proposed by Flemming was based on a recommendation of Food & Drug Commissioner George P. Larrick. He said additional time should be granted for all products, or "additives," including the 3,000-odd which already had been given extensions. Among these were a long list of materials and compounds used in the rubber industry.

The Flemming-Ribicoff bill would allow further time only on a case-by-case basis and where procedures were started by the manufacturer or user of the additive before March 6, 1960, looking toward a resolution of any food additive problem involved. The amount of additional time would likewise be individually determined by FDA "on the basis of the facts in each case."

In his letter to Harris endorsing Flemming's request, Ribicoff asked that the extension bill be approved "as soon as possible" in view of the urgent need of lifting the March 6 deadline.

RMA Petition Approval Urgent

Pending Congressional action on the extension bill, the door is still open to FDA acceptance of the rubber industry's proposal for an across-the-board approval of the catalog of basic materials used in the industry. What the industry wants is FDA's bill of health for a variety of rubber goods made for the food-handling industries which are shown to be safe as long as they are manufactured under rigid standards set by the industry.

Without such approval on all or part of the list of basic materials, FDA could prohibit their use in products such as O-rings or hose for the food industry on grounds that small particles can migrate from the food handling equipment into the food itself, thus constituting a possible harmful "additive" to the food. The mass of data the industry has prepared to back its request for exemption from the law proves, RMA contends, that they are safe for their many food-handling uses.

Kennedy Appointments Indicate Strong Business Regulation Trend

The rubber industry has maintained more than a passing interest in the men President Kennedy appoints to key posts in the business regulation end of his administration. As much as any other industry in the United States, the rubber industry has found itself at one time or other embroiled with one or another of the business regulation enforcement agencies of the Federal Government; so its interest is understandable.

Thus far, the new administration's appointments offer little encouragement to the industry that enforcement will be easier in the future. In fact, what is known about the new administrators might very well be, from the

point of view of the rubber companies, downright disheartening.

Dixon Heads FTC

Take, for example, the new head of the Federal Trade Commission, which has been a thorn in the side of more than one rubber manufacturer in recent years—Paul Rand Dixon. As chief counsel and staff director of Sen. Estes Kefauver's anti-trust and monopoly subcommittee, Dixon earned the reputation of being a very tough censor of business practices to come under the subcommittee's scorching review.

Dixon was the pivotal committee figure in the celebrated investigations of the pricing and trade practices of the automobile, steel, and drug industries. These probes have brought to public notice the tendency of large, concentrated industries to "administer" prices rather than allowing them to be set by supply and demand.

Working in tandem with Dixon when a seat on FTC opens next September will be A. Everett MacIntyre, a protege of Rep. Wright Patman (Dem., Tex.) and currently counsel of the House Small Business Committee. President Kennedy said he will appoint MacIntyre to replace FTC Commissioner Thomas Secrist, whose term expires September 25.

Both Dixon and MacIntyre are staunch advocates of S-11, the legislation which would prevent a manufacturer from defending himself against Robinson-Patman Act violation charges when he cuts his price "in good faith" to meet competition. The rubber industry is violently opposed to this bill, which has been reintroduced in the House and Senate and may skin through this year. With or without S-11, which was opposed by the former Republican management of FTC, the Commission under the new administration can be expected to bear down harder than ever on price discrimination, misleading advertising, and other proscribed practices which have got many a rubber company in trouble.

Loevinger Justice Anti-Trust Boss

The other main instrument at the government's disposal to check illegal business activities—the Justice Department's anti-trust division—will be under the control of one of the most aggressive trust-busters in the country. The President's nominee for the job, Lee Loevinger, also is one of the nation's leading experts on anti-monopoly law. In addition, he's a firm believer in the maxim that the most effective way to enforce the Sherman Act is to encourage private parties injured by anti-trust activities to file suits for triple damages, as permitted under the law.

Adding to the not-too-encouraging business regulation climate now developing in Washington is the fact that the Senate and House anti-trust subcommittees which in a sense oversee the business regulation activities of the executive agencies, will be back at their old stands, still under the management of dedicated trust-busters—Senator Kefauver and Rep. Emmanuel Celler (Dem., N. Y.).

Tariff Act Revision Will Change Some Rates

Congress this session will consider some far-reaching changes in the Tariff Act—including revision of rates on many rubber products—so the RMA is canvassing the industry for comments, pro and con, on what the legislators have in mind. To date, the RMA's public affairs committee is disposed to go along with the changes, even though there are some reductions in rates on rubber products which may result from the new legislation. But RMA first wants comments from member companies after they have had the chance to look over the proposals themselves.

What is involved is a complete overhaul and modernization of the tariff schedules set in the 1930 Tariff Act. The changes, reflecting changed patterns of trade and the appearance of new products which did not exist in the Thirties, were ordered back in 1954 in the Custom Simplification Act passed that year. In the 1954 law the Tariff Commission also was ordered to revamp the 1930 schedules to improve statistical reporting on individual import items. The new tariff classification, drawn up in 10 bulky volumes by USTC, must now be approved by Congress. It is pending before the House Ways and Means Committee, which hopes simply to okay USTC's work in executive session without getting involved in protracted public hearings. If there is any public pressure for open hearings, however, the committee probably would respond.

The reclassified rates on rubber products are listed in four of the 10 volumes. On many items, especially those rubber goods which heretofore were lumped into so-called "basket" categories that could not be broken down to show the volume of imports of a given item, there will be specific new classifications. While the aim of USTC was to leave the level of individual tariffs unchanged, the reclassification has resulted in some increases and some decreases.

The best available analysis of the reclassified rubber rates shows this comparison for major items with the old 1930 schedules:

Passenger, truck and bus tires—no change in the present 8½% duty; off-the-road tires (previously classed with "other" tires)—reduced one-third from the present 12½% duty to 8½%; agricultural implement and tractor tires (previously classified as parts for the vehicles without tariffs)—up to 8½%; bicycle tires—unchanged at 10%; inner tubes for passenger, truck, and bus tires—unchanged at 12½%; inner tubes for motorcycles and airplanes (previously classified in the "parts" categories)—unchanged at 12½%; bicycle tubes similarly classified—no change at 30%; airplane tires—unchanged at 12½%.

In a bulletin to members, RMA's public affairs committee said it agrees that "a sweeping revision of the tariff act (to simplify and make more specific various duty schedules) is long overdue." As far as could be learned from the Ways and Means Committee, no rubber manufacturer had entered any complaint or protest, as of late February, over the proposed classification changes.

URW Notifies Goodyear, Firestone on Contracts

The United Rubber Workers (URW) served notice, February 9, on Goodyear Tire & Rubber Co. and Firestone Tire & Rubber Co. to open negotiations on their company-wide contracts with the labor union. URW pacts with the two companies, renegotiation of which will set the pattern for new contracts in the industry as a whole, expire April 15. The negotiations—starting dates and sites will be announced later—cover about 37,500 URW members, 20,000 in Goodyear plants and 17,500 in plants of the Firestone company.

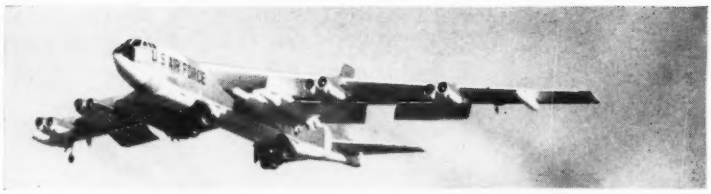
URW has not detailed all of its objectives in negotiating a new biennial contract with Goodyear and Firestone. The present company-wide contracts include Supplemental Unemployment Benefit (SUB) agreements, however, and the union has made clear what it wants in the way of a new SUB agreement.

At the 1960 URW convention, delegates went on record favoring an SUB clause in any new contract which parallels that which was written into the master labor agreement between URW locals and The General Tire & Rubber Co. some time ago. That agreement provides for a weekly benefit of 80% of an injured workman's past average earnings of a normal work week.

Regarding new wage adjustments in a renegotiated contract, URW has staked out no specific claims. It would be unusual, however, for the union not to want a liberal settlement of this issue, notwithstanding President Kennedy's appeal to business and labor alike to hold price and wage levels down; negotiation of new contracts every two years all the way back to 1953 has brought the largest wage increases.

The increase granted company-wide that year was 12¢ an hour; in 1955, the

settlement jumped to 14¢; and in 1957 it rose to 15¢. When the new contract negotiations deadlocked the next time around in 1959, a wave of strikes hit the industry; major firms were shut down with strikes ranging between three weeks and two months. When the settlement finally came, the wage boost was only 10¢ an hour, but the main issue in the negotiations involved non-economic issues such as pension and welfare plans plus general work conditions.



Firestone Tire & Rubber Co., Akron, O., is supplying the new Boeing B-52H missile bomber with eight 56x16, 38-ply rating tubeless tires, with wire fabric reinforced treads for high-speed requirements and a special wire mesh which provides an ice grip feature. The company also supplies two 32x8.8, 12-ply rating wing tip tires

Lack of Carbon Black Shuts Cuban Plants

Remember those rubber plants in Cuba which Fidel Castro seized from Goodyear, Goodrich, Firestone, and U. S. Rubber? Well, the once-flourishing Cuban rubber industry, which is to say those four plants, has ground to a halt, according to the Associated Press.

In a February 20 dispatch from Havana, AP reported that despite Castro's boasts that Cuba has thwarted the U. S. economic embargo, many Cuban industries are paralyzed by shortages of raw materials and spare parts. Those which still operate do so only sporadically, AP said.

"This is particularly true of enterprises formerly owned by Americans," the wire service said and cited the rubber manufacturing industry on the island as a "prime example."

The industry "used to turn out 10-12,000 automobile and truck tires a week," AP stated. "Now it produces about 300, all from one of four factories that used to be run by Goodyear, Goodrich, Firestone, and U. S. Rubber.

"This plant will close down its production line (on February 21) because of acute shortages of raw materials, especially carbon black—one of the essential ingredients in tire manufacture. . . .

"Unless some carbon black and certain other essentials are found quickly, Cuba's tire production is a dead duck."

Quoting industrial sources, AP said Cuban authorities "made desperate efforts to get substantial quantities of carbon black in Canada, but failed. They turned next to Europe, seeking offers on both sides of the Iron Curtain without immediate result." Meantime, many former workers at the rubber plants have been transferred to other jobs, AP said, quoting one transferee as saying "we'll all be out cutting sugar cane if this keeps up."

A new inflatable gangplank was constructed for the nuclear-powered submarine *Theodore Roosevelt* by The Goodyear Tire & Rubber Co., Akron, O. Made of Airmat, an air inflatable rubberized fabric material, the gangplank will support 1,500 pounds and will minimize storage problems because it can be quickly deflated and also can be rolled up easily between uses

Cake Asks for Comment On CAC Research Plans

The American representative on the recently established Coordinating Advisory Committee (CAC) of the Malayan Rubber Fund Board is asking the U. S. rubber industry for suggestions on new rubber research projects underwritten by the Board as well as for comments on research programs already under way.

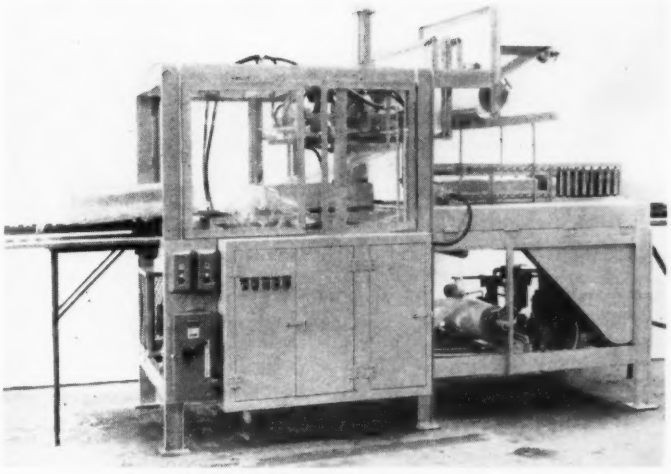
W. E. Cake, vice president of United States Rubber Co. and the only American member of CAC, asks that suggestions and comments appropriate for consideration by the advisory committee be sent to him at 1230 Avenue of the Americas, New York 20, N. Y. The invitation is for "anyone associated with the rubber industry in the United States."

Cake said suggestions might be made "for work projects at the Rubber Research Institute of Malaya and/or at the Natural Rubber Producers' Research Association." Comments on research programs and actual work being conducted by these two research stations also will be welcome. He noted that the stations now are conducting considerable work on mixtures of natural rubber with various synthetics to determine behavior, characteristics, and uses of such blends, and that therefore it is not necessary to confine proposals and comments to natural rubber subjects alone.

CAC's chief function is to advise the Malayan Rubber Fund Board on the scope, content, and coordination of research programs financed wholly or in part from the rubber fund. Also for this, CAC is charged with examining and discussing the research programs of the Rubber Research Institute of Malaya and the Natural Rubber Producers' Research Association.

industry news

TEXUS Develops New Wrap for SBR Bales



Rubber baler developed by Texas-U. S. Chemical Co. is shown in operation. *At right*, conveyor belt slides rubber into position. *Center*, a bale is being wrapped in film, which is then heat sealed; and, *left*, the packaged bale slides on to a belt to be taken to storage and shipping area

Texas-U. S. Chemical Co., Port Neches, Tex., has developed a machine to wrap and heat-seal bales of synthetic rubber in thermoplastic film such as polyethylene or polystyrene. The company says the machine, on which it has recently been granted a United States patent, eliminates film breakage due to cold flow of the contents, one of the problems with present methods of packaging rubber in polyethylene.

The bale wrapper is now being manufactured commercially by J. & J. Mfg. Co., Beaumont, Tex., under license from TEXUS.

The unit employs a simple, single-pass operation, which can be easily incorporated in any existing conveying or packaging line, according to the company. Bales of rubber transmitted to the machine by roller conveyors are positioned between top and bottom sheets of clear or opaque plastic film such as polyethylene, biaxially oriented polystyrene, or a polyethylene-polyisobutylene blend. A time-cycle controller regulates electrically heated sealing surfaces which rapidly form a thermoplastic protective envelop having sufficient space on all sides for in-transit flow of the rubber without breakage of the enclosing film. This contrasts with the rather tight fit of conventional bags.

The machine has reached speeds of eight to 10 bales a minute, and average rate amounts to 100 million pounds of rubber per machine, the company claims. During five years of use the device has wrapped 875,000 long tons of SBR rubbers of many different types.

Besides packaging SBR rubbers, the baler is suggested for polymers having high flow properties or high tack, such as butyl and the stereo specific rubbers. The company also suggests the baler for wrapping other materials which tend to swell, flow, or have plastic memory, and where an anti-tack or vaporproof package is important.

The baler is currently used with polyethylene film 1½ mils thick, but can handle 10-mil films.

Texas-U. S. Chemical says that the baler involves a low initial investment, about $13,000, and has lower maintenance costs than other packaging machines because of its less complex design. It also eliminates many storage and shipping problems and reduces package complaints and adjustments, the company further declares.

Easy identification of the type of polymer in each package is made possible by use of printed film strips, preprinted film, or a film printer.

Goodrich-Gulf to Build Polybutadiene Plant

Goodrich-Gulf Chemicals, Inc., Cleveland, O., will build a multi-million dollar plant at Institute, W. Va., for the commercial production of Ameripol CB, *cis*-polybutadiene rubber. Expected to be in operation by the end of this year, the initial unit will start with an output of 20 million pounds annually.

The announcement follows the *cis*-polybutadiene licensing program initiated by the company last August. At that time the firm offered to license the manufacture of stereo specific rubbers under its patents, together with sublicenses under pertinent catalyst patents held by Professor Karl Ziegler of Germany. The company has already granted licenses to two synthetic rubber producers, and negotiations are continuing with a number of others both at home and abroad.

U. S. Rubber Expands L. A. Tire Facility

United States Rubber Co., New York, N. Y., plans to spend $6 million in the next five years to modernize and expand its Los Angeles tire plant to meet the needs of the tire market.

G. Raymond Cuthbertson, vice president and general manager of the tire division, disclosed that "this year motorists in the Los Angeles metropolitan area are expected to spend about $109 million for approximately 2,600,000 new passenger tires, 277,000 new truck tires, and 2,400,000 retreaded passenger and truck tires."

He further indicated that in 1965 the replacement-tire market in that area will reach about $140 million, a slightly more than 27% increase.

U. S. Rubber Producing Two-Ply Tires for Both Standard and Compact Cars Since Early 1958

United States Rubber Co., New York, N.Y., has been selling two-ply passenger tires for both standard and smaller cars since early in 1958, the company reported.

All the major tire companies have announced that they are shipping two-ply tires to auto companies for evaluation as original equipment, and there has been some indication that the smaller companies have made small quantities of replacement two-plies. The U. S. Rubber announcement, however, is the first indication that two-plies are actually on the market for standards as well as compacts.

Auto industry spokesmen have predicted that two-ply tires will be adopted as original equipment for the 1962 model compact cars and as original equipment for standard models the year after.

The rubber company announcement said that it has sold more than 350,000 two-ply passenger tires on the domestic replacement market since it began production in the second quarter of 1958, and that total production for both original equipment and replacement tires has reached the 500,000 mark.

Two-ply tires made and sold by the company include the following sizes: tubed nylon, both black and white-wall, 6.70-15 and 7.10-15; tubed rayon, black, 6.70-15, 6.00-16, and 7.10-15; tubed rayon, white-wall, 6.70-15 and 7.60-15, and tubeless nylon, both black and white-wall, 7.50-14.

Depending on the model, current compacts use 13-, 14-, and 15-inch tires, and standards carry 14- and 15-inch tires. The 6.00 and 6.70 tires are compact sizes and the 6.70, 7.10, 7.50, and 7.60 standard sizes.

G. Raymond Cuthbertson, vice president and general manager of the tire division, said the tires are giving "excellent service. . . . Our actual road experience and tests show that the two-ply tire equals the four-ply in strength and mileage and gives a softer, smoother ride," he declared. "It is a cooler-running tire and has a greater safety factor at high speeds."

Cuthbertson said the original-equipment tire has two plies of 3,300 denier rayon tire cord, compared with the 1,650 denier cord used in four-ply tires. A new rubber compound and a lower cord angle give the tires stability on the road, and the bead or "rim" construction of the tire is actually stronger than it is on the four-ply tire, he claimed.

He added that there is just as much rubber and as much tire cord, by weight, as in the four-ply tire.

"While two-ply tires are a relatively new development in this country, more than 5,000,000 of them have been manufactured in France and Belgium since 1945 by Englebert, S.A., U. S. Rubber's European affiliate," Cuthbertson said. "In 1960 Englebert produced 580,000 two-ply tires."

Most of the major tire companies have been making two-ply tires for the small European cars in their plants abroad for a number of years. However, the weight difference, and therefore the load, is considerably greater for the U. S. compacts, and even greater for standard models.

With the two-ply well on its way toward becoming the tire of the present, the tire of the future is already on the horizon. Engelbert, S.A., Cuthbertson said, is already making one-ply rayon passenger tires.

Chemstrand Purchase

Stockholders of both American Viscose Corp. and Monsanto Chemical Co. have approved the acquisition by Monsanto of Avisco's half-interest in Chemstrand Corp. The acquisition will make Monsanto sole owner of Chemstrand, which is the nation's second largest producer of nylon and acrylic fibers.

American Viscose will give up its 50% interest in Chemstrand in exchange for 3,540,000 shares of Monsanto common stock, according to the plan approved. Although the stock transfer would make American Viscose largest single stockholder in Monsanto, the company will not vote its stock. Instead it will hold the Monsanto stock as an investment and pass on the voting rights to its stockholders on a pro rata basis.

PB Plant Contract

The Chemical Plants Division of Blaw-Knox Co., Pittsburgh, Pa., has been awarded a contract to build and design the new Goodrich-Gulf Chemical Co. plant at Institute, W. Va., for production of Ameripol CB. The plant, expected to be in operation by the end of the year, will have an annual capacity of 20 million pounds of polybutadiene rubber.

Blaw-Knox is also assisting Goodrich-Gulf in development of information for prospective licensees of the process for production of polybutadiene rubber.

The engineering firm built six full-scale and five semi-commercial SBR plants in 1942 and 1943 and more recently completed the first large-scale synthetic rubber plants in Great Britain and Japan. It is now building Brazil's first synthetic rubber plant, with an annual capacity of 40,000 tons.

Industrial Rayon Sets Midland-Ross Merger

Directors of Industrial Rayon Corp., Cleveland, O., and Midland-Ross Corp., Cleveland, O., have agreed in principle to a merger of the two firms. Stockholders will be asked to vote on the merger plan late in April.

Under terms of the merger Industrial Rayon will operate as a division of Midland-Ross, with Frederick L. Bissinger, president of Industrial Rayon, becoming a vice president of the merged concern in charge of the division.

The merger would involve exchange of two-fifths of a share of Midland-Ross common stock for each of the 1,851,255 outstanding shares of Industrial Rayon stock.

Industrial Rayon is a producer of rayon tire cord for tires and other industrial uses, and of textile rayon yarn for the apparel and home furnishing industries.

Midland-Ross Corp. designs and manufactures products for the automotive, steel, appliance, food, paper, rubber, electronics, construction, missile, and aircraft industries.

Industrial Rayon, beset by severe price competition from nylon tire cord producers, lost $2,403,672 in the first nine months of 1960 and late in the year sold its Covington, Va., nylon plant to Hercules Powder Co. for $7,500,000, announcing that it was consolidating its operations into a large plant at Painesville, O., in an effort to reduce operating losses.

A year ago it attempted to merge with Texas Butadiene & Chemical Corp. as a diversification measure, but the merger was called off after it had been approved by stockholders after a group of stockholders threatened to demand cash in lieu of Texas Butadiene stock.

Radiation-Resistant Compounds Developed

Precision Rubber Products Corp., Dayton, O., has announced two new compounds for use in nuclear systems where there is exposure to gamma radiation. These are Compound 1387, where resistance to petroleum-base lubricants is essential, and Compound 4387, where low-temperature flexibility and service in water are essential, but where it is not necessary to have oil resistance.

Compound 1387 represents O-ring material with radiation resistance up to a maximum of 1×10^9 roentgens and resistance to air, water, fuels, and oils, and Compound 4387, an O-ring material with radiation resistance of a maximum of 1×10^9 roentgens and resistance to water and air, with good low-temperature flexibility.

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No. 14

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	Without C-566 A	With C-566 B
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Zinc Oxide	4	
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Ultex	0.75	
Sulphur	2.75	
C-566	....	7.5
	158	165.5

Mooney Scorch SR @ 250° F.

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Minutes to 5-point rise	5.75	8.5
Minutes to 10-point rise	6.25	11.0

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Committee D-11 Assigns Three SBR Numbers

Committee D-11 on Rubber and Rubber-Like Materials of the American Society for Testing Materials, through Subcommittee 13 on Synthetic Elastomers, has assigned numbers to two low-viscosity SBR copyolymers and a black masterbatch. Number 1024 was assigned at the request of Phillips Chemical Co., Akron, O., and Numbers 1511 and 1610 were assigned at the request of Goodrich-Gulf Chemicals, Inc., Cleveland, O.

DESCRIPTION OF TYPES OF STYRENE-BUTADIENE (SBR) ELASTOMERS, ASSIGNMENT OF NEW CODE NUMBERS— ASTM D-11 1419-56T

Number as assigned	1024	1511	1610
Date assigned	1/13/61	1/9/61	1/9/61
Requested by	Phillips Chemical Co.	Goodrich-Gulf Chemicals, Inc.	Goodrich-Gulf Chemicals, Inc.
Distinctive feature	Low Mooney	Low Mooney	ISAF black
Close previous number	1010, 6701	1508, 1510	1608
Type	1000	1500	1600
Nominal temp., °F.	122	43	43
Activator	——	FRA	FRA
Shortstop	ND	ND	ND
Antioxidant	NST	NST	ST
Catalyst	P	OHP	OHP
Emulsifier	FA	FA	RA
Nominal bound styrene, %	25	23.5	23.5
Conversion, %	68	60	60
Mooney Viscosity ML 1+4 (212° F.), polymer	30	40	——
Compound	35	70	57
Coagulation	Alum	SA	Acid
Carbon black type	——	——	ISAF
Phr.	——	——	52
Oil type	——	——	HI-AR
Phr.	——	——	10
Finishing	Normal	Normal	Normal

Note: Abbreviations and symbols are defined as follows:

FA = fatty acid
FRA = free radical type, i.e., iron-pyrophosphate, peroxamine sulfoxylate
HI-AR = highly aromatic
ISAF = intermediate super abrasion furnace
ND = non-discoloring
NST = non-staining
OHP = organic hydroperoxide
P = peroxide
RA = rosin acid
SA = salt acid
ST = staining

Goodrich Purchases Rayco Mfg. Co.

The B. F. Goodrich Co., Akron, O., has purchased Rayco Mfg. Co., distributors of shock absorbers, mufflers, and seat covers. The rubber company plans to market its tires through 125 Rayco retail outlets in 17 major markets.

According to the transaction, Goodrich will acquire all of Rayco's issued shares in exchange for Goodrich stock. Joseph Weiss, president of Rayco, will continue to direct its activities.

Reclaimers Elect Dixon

Henry L. Dixon, Adhesives Products, The B. F. Goodrich Co., Akron, O., has been named president of The Rubber Reclaimers Association, Inc., New York, N. Y., for 1961.

Other officers elected include: Donald L. McCollum, Naugatuck Chemical Division, United States Rubber Co., Naugatuck, Conn., vice president; Charles T. Jansen, *Adhesives Age* and *Rubber Age*, secretary-treasurer; T. H. Fitzgerald, Naugatuck Chemical, chairman of executive committee; and C. H. Peterson, U. S. Reclaiming Co., Buffalo, N. Y., chairman of education committee.

Eberhard Faber Enters Industrial Rubber Field

Eberhard Faber, Inc., Wilkes-Barre, Pa., has formed an Industrial Rubber Products Division, which is the first of the company's diversified operations to be taken out of the writing instruments field. The new division will design and manufacture molded rubber products for the automotive and aircraft industries and will extend its operations into other fields.

In another move, Eberhard Faber Premium Sales Co., Inc., will specialize in premium sales merchandise.

Du Pont Builds Plant

E. I. du Pont de Nemours & Co., Inc., Wilmington, Del., plans to construct a multi-million-dollar facility for the manufacture of acetylene by a new process, a modified arc technique, at the site of its neoprene plant, Montague, Mich.

The new unit, which will produce acetylene from low-cost hydrocarbons, will be the company's first basic facility for the manufacture of acetylene, one of neoprene's chief raw materials.

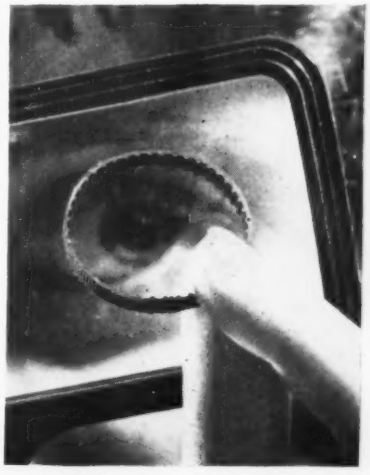
Montecatini Fellowship Offered to American

Montecatini Soc. Gen., Milan, Italy, is offering, through the American-Italy Society, a $3,600 fellowship for a year's study on high polymers at the Polytechnic Institute of Milan, under the direction of Professor Giulio Natta, director of the Institute of Industrial Chemistry and a noted high polymer chemist.

To be eligible for the fellowship, which covers the academic year September, 1961, through June, 1962, applicants should have completed some graduate studies in chemistry, but the competition is also open to outstanding undergraduate students who will be awarded a Bachelor's degree by June, 1961. A working knowledge of Italian is necessary by the time the fellowship becomes effective.

Qualified applicants should submit a detailed résumé to the American-Italy Society, 22 E. 60th St., New York, N. Y.

An inspector at the Lincoln, Neb., plant of The Goodyear Tire & Rubber Co. uses a magnifying glass to check a tiny positive drive belt for a new duplicating machine. The cogged belts, fabricated over a carcass of tough fabric strands, are bringing new concepts to the design of small machinery and instruments by eliminating gear drives and simplifying engineering and manufacture



news briefs

GENERAL LATEX & CHEMICAL CORP., Cambridge, Mass., has announced the availability of a new latex backing for fabrics with excellent dye receptivity. The new line of upholstery compounds will receive the dye to the extent that the backing is the same color as the fabric.

CANADIAN GENERAL-TOWER, LTD., Galt, Ont., Canada, has sold its floor covering division to Building Products, Ltd., Montreal, P.Q. Canadian General-Tower plans to expand the operations of its other divisions which include the manufacture of vinyl coated fabrics, vinyl films, and sheetings.

THE BORDEN CHEMICAL CO., New York, N. Y., has formed a new international division and has appointed John J. O'Connor as senior vice president. He will be responsible for the operations of eleven Borden Chemical overseas companies in Mexico, Colombia, Brazil, Argentina, Canada, Australia, England, France, and the Philippine Islands.

BARNETT J. DANSON & ASSOCIATES, Ltd., Toronto, Ont., Canada, has been made exclusive sales representative in Canada for National Rubber Machinery Co., Akron, O. The company will market National Rubber's complete line of thermoplastics extruders and accessory production equipment.

AMERICAN CYANAMID CO., New York, N. Y., has opened a new pigments sales office in Kansas City, Mo. Alan W. Popp, formerly sales representative in the St. Louis office, heads this new office.

BUILDING PRODUCTS, LTD., Montreal, P.Q., Canada, has acquired all outstanding stock of Robbins Floor Products of Canada, Ltd., with an office, warehouse, and plant in Granby, P.Q., from Robbins Floor Products, Inc., Tuscumbia, Ala., thus obtaining use of the Robbins name and trade mark in Canada.

JOMAC, INC., Philadelphia, Pa., has moved its New York office to 1700 Tonnelle Ave., North Bergen, N. J.

SHELL CHEMICAL CO., synthetic rubber division, has changed its eastern district address to 500 Summer St., Stamford, Conn.

DAYTON INDUSTRIAL PRODUCTS CO., Melrose Park, Ill., has established a new regional sales office and warehouse at Linden, N. J.

AMERICAN MINERAL SPIRITS CO. has moved its Chicago office to 200 S. Michigan Ave., Chicago 4, Ill.

ARROWHEAD PRODUCTS DIVISION, Federal-Mogul-Bower Bearings, Inc., will build a new million-dollar facility in Los Alamitos, Calif., only a ten-mile move from its present location in Long Beach; this move will affect few of its 390 employes. Arrowhead supplies rubber, plastic, and stainless-steel fabricated components to the aircraft and missile industry.

The new Pop Warner League football sole, manufactured exclusively by Beebe Rubber Co., Nashua, N. H., has been designed especially to meet high abrasive specifications and wearing standards set by the League. Saucony Shoe Co., Allentown, Pa., has been granted exclusive rights to use the Pop Warner sole on all its football shoes. This is the first time that the organization, which represents several thousand teams in the U.S.A., has granted official approval to a sole, and it will be used on all officially approved shoes

MONSANTO CHEMICAL CO., St. Louis, Mo., is now supplying commercial quantities of nonyl phenol and dodecyl phenol from its Kearny, N. J., plant. The products are widely used as intermediates in the manufacture of nonionic surfactants and to some extent in rubber chemicals and motor oil additives.

NEVILLE CHEMICAL CO., Pittsburgh, Pa., has made Smith Chemical & Color Co., Inc., Brooklyn, N. Y., its representative in metropolitan New York and northern New Jersey.

RAYON PROCESSING CO. OF R. I., Pawtucket, R. I., has changed its name to Microfibres, Inc., as it now offers a complete range of precision-cut natural, synthetic, and metallic fibers.

AMERICAN ENKA CORP., New York, N. Y., has created three separate operating divisions for nylon, rayon, and wire and cable products. Each one will be headed by a general manager reporting directly to President Philip B. Stull. Frits Prakke and Claude S. Ramsey, Jr., have been appointed general managers for the nylon and rayon divisions, respectively. Maurice Winger, Jr., general manager of the Brand-Rex division since May, 1960, will continue to serve in his present capacity.

HARRISONS & CROSFIELD (PACIFIC), INC., has been formed with a central office in San Marino, Calif., and branch offices in Seattle, Wash., and San Francisco, Calif. The new company, a consolidation of the western offices of Harrisons & Crosfield (America), Inc., and Wharton Jackson Co., supplies industrial raw materials and chemicals from domestic and overseas affiliates. Wharton Jackson is vice president of the San Marino office, and R. J. Davidson is vice president of the Seattle one.

THE CANADIAN HANSON & VAN WINKLE CO., LTD., Toronto, Canada, has formed a new division for corrosion-resistant construction (cement, plastics, and coatings), which will also line tanks, piping, and other equipment with plasticized vinyl and neoprene synthetic rubber. T. J. V. Cudbird has been named manager.

news about people

C. A. Berridge

R. F. McCabe

F. W. Turner

P. L. Courtney

E. N. Cunningham

Charles A. Berridge has been named sales representative of the silicone products department of General Electric Co., Waterford, N. Y. His office will be located in Downey, Calif.

Robert F. McCabe, manager of automotive industry sales for the Naugatuck Chemical Division, United States Rubber Co., Naugatuck, Conn., has been appointed Detroit district sales manager. **Alfred J. Rosborough, Jr.,** has been named a technical sales representative out of Detroit.

Frank A. LePage, former chief engineer of the Firestone Tire & Rubber Co. tire plant at Sao Paulo, Brazil, is now senior engineer in charge of all engineering for the company's tire plants.

Russell T. Smith, sales representative for the industrial chemicals department of Commercial Solvents Corp., New York, N. Y., has been assigned to the Cincinnati district office.

Hayes Benson Robinson has been appointed manager, extrusion department, Accurate Products Co., Inc., San Diego, Calif. **Jack M. Innis** becomes general sales manager.

Howard E. Drew succeeds **S. E. Harrison** as factory manager of the Chicopee Falls, Mass., tire plant of United States Rubber Co., New York, N. Y.

Howard H. Armstrong has been appointed manufacturing manager, molded goods and cutless bearings, processing department, for B. F. Goodrich Industrial Products Co., Akron, O.

Frank Wesley Turner has joined the rubber chemicals sales division of Phillips Chemical Co., Akron, O. He will be headquartered at St. Louis, Mo., to service accounts for the western district of the rubber chemicals sales division office in Chicago, Ill.

John A. Aron has been made general manager, export division, The General Tire & Rubber Co., Akron, O.

Robert A. Merrill becomes director of product development for United States Rubber Co., tire division, New York, N. Y.

Richard B. Cuddeback, formerly technical representative for Linde Molecular Sieves, Linde Co., Division of Union Carbide Corp., New York, N. Y., has been appointed supervisor of market development for the product line.

H. L. Williams has accepted the position of assistant manager, research and development division, Polymer Corp., Ltd., Sarnia, Ont., Canada. He will be responsible for the copolymer and butyl section. **L. A. McLeod** becomes assistant manager, solution polymer section; while **N. J. McCracken,** assistant manager, research and development division, will devote full time to a special assignment.

William J. Worrell has been elected a director of The Bearfoot Sole Co., Wadsworth, O.

B. K. Ziemann becomes sales manager of Seiberling Rubber Co. of Canada, Ltd., Toronto, Ont., Canada.

Philip L. Courtney succeeds **Wilbur J. Driver** as vice president in charge of the clay division of J. M. Huber Corp., New York, N. Y. **Charles H. Marvin, Jr.,** manager of the South Carolina operations, becomes assistant vice president, and **Frank M. Gribble** general manager of the Georgia operations.

Edward N. Cunningham, sales manager of Precision Rubber Products Corp., Dayton, O., has been made a vice president of the company.

J. A. Moffitt, Jr., has been appointed marketing manager of The Connecticut Hard Rubber Co., New Haven, Conn. **A. J. DeFrancesco** becomes sales manager.

Homer D. Harrington has been made assistant manager, the overseas division, in charge of technical matters for The General Tire & Rubber Co., Akron, O. **Joseph J. Delaplane** has been promoted to assistant manager of the division, in charge of production and engineering.

G. W. Hill, New York manager of B. F. Goodrich International Co., Akron, O., has been made general sales manager for the division, with headquarters in Akron.

R. E. Metzger has been promoted to technical representative, European area, for The General Tire & Rubber Co., Akron, O.

John G. Eisenhart has been made promotion manager of Firestone Synthetic Rubber & Latex Co., Akron, O.

news about people

Thomas H. Fitzgerald has been named manager of the east central district of the national sales operation of General Electric Co., silicone products department, Waterford, N. Y.

Howard Swires has been made managing director of The General Tire & Rubber Co. plant in Santiago, Chile.

Howard L. Burpo, Jr., has been made Midwest regional manager of Union Carbide Plastics Co., Division of Union Carbide Corp., New York, N. Y.

George A. Burnell, an industrial engineer for The B. F. Goodrich Co., Akron, O., will go to Manila, Philippines, to train Filipino personnel for Goodrich International Rubber Co., an associate company.

G. A. Spaulding becomes plant manager of the Fort Wayne, Ind., tire plant now under construction by The B. F. Goodrich Co., Akron, O.

Kenneth B. Hawthorne has been made general product manager, U.S. Tires division, United States Rubber Co., New York, N. Y.

Matar Studio

T. H. Fitzgerald D. A. Brown

Donald A. Brown has been appointed sales representative for New Jersey Zinc Co., New York, N. Y. His territory consists of Tennessee, Alabama, Mississippi, and Louisiana.

John B. McCarthy, special sales representative in the Caribbean area for International B. F. Goodrich Co., Akron, O., has been made New York manager for the company.

Harry Saulter, formerly with American Latex Corp., is now on the technical staff of W. J. Voit Rubber Corp., Los Angeles, Calif.

Michel Neumand becomes sales manager for United Carbon France, S.A., the new French subsidiary of United Carbon Co., Inc., New York, N. Y. **H. L. Kirchschlager** has been made product manager for sales to South America and Mexico.

Mrs. Marie Bell has been named purchasing agent for Oliver Tire & Rubber Co., Oakland, Calif., replacing **L. D. Svendsgaard.**

Lloyd Skaggs has joined the staff of TRW Computers Co., Canoga Park, Calif., as district sales manager, with headquarters in Houston, Tex., responsible for the Southwest region.

John E. Dereich has joined the technical division staff of Neville Chemical Co., Pittsburgh, Pa.

R. Bruce Baptie has been named sales manager of Carwin Co., North Haven, Conn., manufacturer of organic chemicals, specialty isocyanates, and high-temperature resistant polyurethane foams.

Richard G. Denton has joined the dust and fume control division of Wheelabrator Corp., Mishawaka, Ind., as regional dust and fume engineer in the California-Nevada-Arizona territory. He will operate from the firm's Los Angeles and San Francisco offices.

Howard Hummer, after 43 years with the present Firestone and Xylos organizations, has announced his retirement. His tenure of service began in Akron, O., and he was one of the original staff who started the California company in 1928. In 1944 he was appointed vice president of the Xylos organization.

D. C. Cochran has retired as president of Southern Latex Corp., Austell, Ga. He will, however, continue as a management consultant for the firm. **George N. Brunt,** general manager, takes over all operational phases of the company, and **P. C. Chesney** becomes general sales manager.

Guy Nolan, technical representative of the Thiokol Chemical Corp. West Coast office, has been transferred to the home office in Trenton, N. J., and will call on accounts on the East Coast. He has been succeeded by **Thomas D. Mahoney.**

W. E. Ostman has been appointed general superintendent of oil-tool manufacturing for the Byron Jackson Division, Borg Warner Corp., with oil-tool plants in Vernon, Calif., and Houston, Tex. Besides manufacturing, Ostman's responsibilities include production control, industrial engineering, export, and local order departments.

Golf cars now can be equipped with Terra-Tires from The Goodyear Tire & Rubber Co., Akron, O., which, because they require only five pounds of pressure per square inch and have a 15-inch-wide "footprint," do not damage the ground, Goodyear says. Terra-Tires not only extend the golf season, but also reduce the power consumption in battery operated cars as much as 50%, tests show

Mayor Leo Berg, of Akron, O., and secretary Mary Ann Petruszak prepare to mail a special message inscribed in rubber to the people of India. The greeting, from Mayor Berg and the citizens of Akron, was inspired by the cornerstone-laying at the Goodyear Tire & Rubber Co.'s new $12 million tire plant in Ballabgarh, India. The message will be hung in the plant lobby

news from abroad

Goodyear, Standard Vacuum Construct Australia's First SBR Polymer Plant

Goodyear Tire & Rubber Co., Akron, O., and Standard Vacuum Oil Co. of Australia are building an SBR plant in Altona, a suburb of Melbourne, Australia. The plant, which will go on stream this fall, will have a capacity of 35,000 tons, enough to supply all of Australia's current needs of SBR.

It is also expected that production will include black masterbatches, since the oil furnace black plant of Australia Carbon Black Pty Ltd. is located in Altona. The plant, a joint venture of Cabot Corp. and United Carbon Co., has a capacity of 15,000 tons of carbon black a year, enough to supply all or most of Australia's needs.

The SBR plant, owned 70% by Goodyear and 30% by Standard Vacuum, will produce mostly cold and oil-extended rubber.

Australia's new rubber consumption has doubled in the past 10 years, from 27,800 long tons in 1949 to 56,500 long tons in 1959. Of this consumption, 35% was synthetic rubber and 65% natural rubber.

Almost 80% of the country's total rubber usage is for tires and tubes, compared with 63% in the United States. At the end of 1959, Australia had 2.6 million vehicles registered, and by 1970 it is estimated that there will be 4.25 million vehicles, with 350,000 added per year. This figure would give a production of 6.5 million tires a year, compared with 4 million at present, with a resulting consumption of 100,000 tons of rubber a year, near double the present figure.

Increased Supplies Sought

In anticipation of this increased consumption, Australia is not only looking forward to a domestic supply of synthetic rubber, but is trying to develop its own supply of natural rubber. Although natural rubber is not grown in Australia, some 28,000 acres of land in the territory of Papua and New Guinea are planted to rubber. Exports from the territory were only about 4,380 tons in the year 1958-59, or about 11% of Australia's requirement, although it is expected to increase to nearly 5,000 tons a year by 1965.

Yield of the trees is low, only about 314 pounds per acre. The Australian Government is trying to encourage planters to replace their low-yielding trees with high-producing stock. Stocks of high-yielding plants are being built up, and a rubber experimental station has been established near Port Moresby. A set of standard grades has been set, and a system of inspection adopted to insure that rubber produced corresponds to world standards. There is no expectation, however, of any great increase in production of natural rubber from the territory, all of which is bought by Australian manufacturers.

In addition, trial plantings have been done in some parts of West Australia to investigate the possibility of growing guayule rubber. The United States did experimental work on guayule during World War II.

In the tire cord field, Courtaulds of Australia is producing Tyrex rayon tire yarn, the British Nylon Spinners has announced its intention of producing nylon tire cord in Australia. An American company is also expected to build a plant there.

Machinery Adaptations Being Made

Cord processing calenders have been changed in design, with skew roll adjustment or roll bending replacing cambered rolls to obtain infinite control of roll deflection in order to obtain even gage across the cord regardless of the plasticity of the stock being calendered. Calender speeds have been increased, and modern four-roll units have been introduced which run up to 100 yards a minute.

New screws have been developed for tread extruders which in combination with auxiliary pressure feed rollers give more than 40% increase in output, and duplex extruding heads with twin opposed extruders produce one-piece treads which have different stock qualities in tread and sidewalls.

Passenger, light truck, and tractor tires are being built by a method where cut plies are fed direct from a table extension at the bias cutter straight into the servicing turret at the building machine. This eliminates the operations of batching cut plies, storage, pocket and band building. It is estimated that the new method means an increase of 100% in passenger tire and 50% in truck and tractor tire output.

Polymer in France

Polymer Corp. (SAF) has been organized by Polymer Corp., Ltd., Sarnia Ont., Canada, in partnership with the Banque de Paris et des Pays-Bas for the purpose of constructing and operating a plant in France to produce special types of rubber.

The plant is to be built on a 175-acre site at La Mantzenau near Strasbourg, which is centrally located with respect to rubber-consuming areas, on the Rhine River, facilitating water transportation, and on the crude-oil pipeline route from the Mediterranean to the refineries which will be located in the area. The estimated capital requirements for the project are about $12,000,000.

R. E. Hatch, who will remain vice president-marketing, Polymer Corp., Ltd., was named president of the new company, and S. C. Kilbank, who was until recently area sales manager for Polymer, was appointed general manager of the new concern.

Thailand Exports Down

Thailand's exports of natural rubber during the first 10 months of 1960 were 136,473 long tons, contrasted with 144,441 long tons for the same period of 1959. Despite this decline, the value of rubber exports topped that of rice exports for the first time in the country's history.

The United States now takes 60% of Thailand's rubber, compared with 97% up to about two years ago.

Reclaimator Facility Planned for Britain

U. S. Rubber Reclaiming Co., Buffalo, N. Y., will build a $2,100,000 reclaim plant near Liverpool, England, as a joint venture with Dunlop Rubber Co., Ltd., of England.

The American firm will have 35% ownership in the new plant, and Dunlop Rubber the remainder. The facility, which will employ the Reclaimator process developed by U. S. Rubber Reclaiming, is expected to be in production by the middle of 1962.

This is the first such joint venture for U. S. Rubber Reclaiming Co., which has previously licensed three overseas firms to use its process. The three are Fabrica Argentina de Alpargatas S.A.I.C., of Argentina, Pirelli S.p.A., of Italy, and Gamid Rubber Products & Plastics, Ltd., of Israel.

Fluidized Bed Curing

The Rubber & Plastics Research Association of Great Britain has developed a new process for continuous vulcanization of extrusions in a fluidized bed, according to a report made by A. L. Soden at a recent regional meeting of the group. The process employs a new heat transfer medium of "particulate" material, with heat transference 40 to 50 times that of gas, he said. Its advantages over molten metal baths is that it is not so difficult and dangerous to use, and extrusions do not tend to float on the surface. A horizontal fluid bed has been designed at the Shawbury research center, and a 24-foot high vertical bed is being constructed.

Dunlop Expects Crop At Nigeria Plantation

Dunlop Co., Ltd., expects the first crop of high-grade rubber from its Nigerian plantations this year. More than 11,000 acres have been planted to rubber, and eventually 20,000 acres will be planted, with an expected yield of 1,000 pounds an acre.

Clearing of the land north of Calabar began in 1956, and the end of 1960 some 12,250 acres of jungle had been cleared. Eventually some 8,000 Nigerians will be housed in eight villages on four estates. Dunlop Nigerian Plantations Ltd., subsidiary of Dunlop, is building roads, bridges, a hospital, a central processing factory, and other facilities in addition to the villages.

Nigerians are being trained in the techniques of budgrafting and other specialized estate work and will be instructed in the art of tapping as the trees become mature.

United Carbon Plans Venezuelan Plant

United Carbon Co., Houston, Tex., plans to construct a $3,000,000 carbon black plant in Valencia, Venezuela, the site of three of the four auto-tire manufacturing facilities in that country.

Employing about 60 people at the start, the plant will have an initial capacity of 20 million pounds per year and will produce six major types of furnace blacks. It will be operated by a new corporation, United Carbon de Venezuela, C.A.

Richard W. French, president of United Carbon, states that completion of the plant, late in 1961, will increase current production of South American carbon black manufacture by 40%.

Malayan Exports Fall

Malayan exports of rubber declined from 1,202,747 long tons in 1959 to 1,077,481 long tons in 1960, government figures reveal. Imports were 418,384 long tons, against 458,362 long tons in 1959. Figures indicate a production of 710,000 long tons for the year, slightly under the 720,000 long tons estimated earlier by the International Rubber Study Group.

Great Britain moved into first place as Malaya's best customer, increasing purchases from 158,975 long tons in 1959 to 164,373 long tons in 1960. The United States dropped from 169,681 long tons to 119,517 long tons, becoming second best customer. West Germany increased purchases from 89,836 to 95,808, but Japan and Russia both dropped off. Japan from 120,788 long tons in 1959 to 95,711 in 1960, and Russia from 165,730 to 61,456. Other customers, by order of sales, were France, Italy, Poland, Australia, Czechoslovakia, and China. While Czechoslovakia's purchases increased from 14,859 to 31,125, China's dropped from 49,532 to 29,507.

Russians Offer Credit For Ceylon Tire Plant

Soviet experts have submitted a report to the Ceylon Government for a tire and tube factory designed for eventual output of 600,000 tires and an equal number of tubes. The plan calls for Russian aid to the extent of 29 million rupees of the estimated cost of 41 million rupees. The plant, which would take two years to build, will provide three times as many tires as Ceylon is expected to consume.

The Russian Government is reported ready to provide Ceylon with total credits of 140 million rubles for a number of projects, of which the tire plant is one. Russia bought 2,000 tons of rubber from Ceylon for January shipment.

Ceylon has also agreed to supply 28,000 tons of rubber to China in exchange for 230,000 tons of rice.

Iron Curtain Output

Soviet Russia produced 12.8 million automobile tires during the first nine months of 1960, an 11% increase over output for the corresponding period of 1959, Russia reported. Other figures given for the satellite countries for the first half of the year show: Bulgaria produced 80,000 auto tires and 2,950,000 pairs of rubber shoes; Hungary, 40,274 auto tires and 120,393 truck tires; Czechoslovakia, 653,000 auto tires and 20,278,000 pairs of rubber shoes, exporting 7,763,000 pairs.

Price Stabilization Illusory, Hay Warns

Schemes for stabilizing prices of natural rubber are illusory, John Hay, chairman of Guthrie & Co., Ltd., said in an interview with the *Straits Times* during a recent visit to Malaya.

Producers of natural rubber can beat synthetic manufacturers on cost, but only by efficient production, he declared. Smallholders should be aided by big plantations to increase efficiency, he said, arguing that too many Malayan plantations showed little advance in production methods during the past 30 years.

W. G. Wren, head of the chemical division of the Rubber Research Institute of Malaya, stated after a tour of United States and Canadian rubber research laboratories that natural rubber can afford to undersell "any synthetic likely to be available in the near future."

He added, however, "The natural rubber of the future must be designed to blend with synthetic. It will not be used as 100% natural except in a small way, and it is up to us to produce the best natural for that purpose."

He further declared that research on synthetic is being vigorously pursued, and natural rubber must do equally vigorous research. But he said that of the new *cis*-polyisoprene, *cis*-polybutadiene and ethylene/propylene rubbers, none seems likely to develop a material close to natural rubber at so low a price.

NR Technical Service

Rubber Technical Developments, previously a joint unit of the Natural rubber Bureau and the Natural Rubber

Producers' Research Association, both of London, England, has been made a part of the latter, where it becomes a technical service and development laboratory available to all users of natural rubber.

A group of about six scientists and twelve assistants will devote their efforts to solving compounding and other problems forwarded for review by technical service representatives in the United States and other countries.

Pelletized News

WESTERN NIGERIAN DEVELOPMENT CORP. in anticipation of tapping, will construct a 139,000 rubber processing factory on the Araromi estate. It will make sheet rubber for latex produced at the plantation. Tapping will begin early in April on 423 of the plantation's 8,000 acres, and a yearly yield of 1,200 pounds per acre is expected.

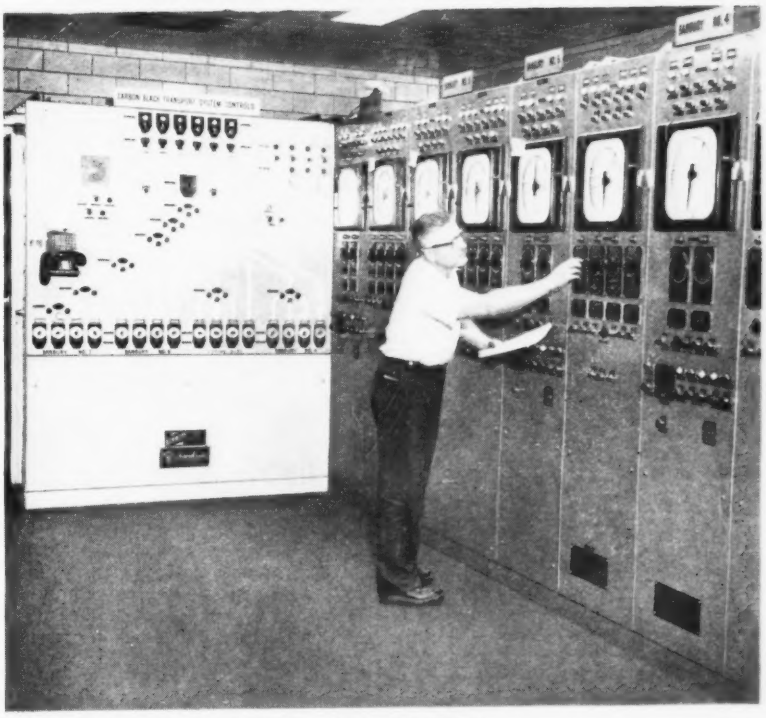
A merger between Royal Netherlands Salt Works, Ltd., Hengelo, The Netherlands, and Royal Sulphuric Acid Works, Amsterdam, is being discussed by managements of the two companies. Under the plan being considered, shares of the companies would be exchanged for shares of a new holding company on the basis of 500 shares in Royal Netherlands Salt for 1,000 shares of Royal Sulphuric Acid. The management of the holding company would be headed by two managing directors, one from each company.

SARAWAK is embarking on a new planting and replanting program that is to cost $35,000,000 (Straits) and aims at planting 90,000 acres of high-yielding clonal rubber by 1964, to come into production by 1970. Costs will be met by a cess of two cents per pound on rubber exported. The program is designed not only to increase the country's output of rubber, but also to reduce present dependence of a large part of the population on subsistence paddy farming. In the first 11 months of 1960, Sarawak exported 46,350 tons of rubber, against 40,747 tons in the same period of 1959.

INDONESIA, finally showing real concern over her position as supplier of rubber, is taking steps to regain her former preeminence in this respect. Rubber growers have been told to diversify production, improve quality, and step up replanting. Remillers, especially in South Sumatra, have been warned that carelessness leading to "degradation of local rubber quality" may cause Indonesia to lose its market abroad. Available figures show that Indonesia exported 398,120 tons of rubber in the first nine months of 1960.

How The Goodyear Tire & Rubber Company gets

QUICK-CHANGE FORMULATION for Carbon Blacks and Oils



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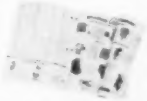

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MATERIALS HANDLING BY WEIGHT SINCE 1902

Rayon Makers Hike Tire Yarn Prices In Move To Brighten Profit Picture

Rayon and Nylon

American Enka Corp., Enka, N. C., raised prices of its rayon tire yarns 2¢ at the end of January, and E. I. du Pont de Nemours & Co., Inc., and Beaunit Mills, Inc., immediately followed suit. Industrial Rayon Corp. and American Viscose, the other large rayon producers, were expected to match the increases.

The price boost brought the price of 1650 denier tire yarn to 51¢ a pound, and 1100 denier to 57¢ a pound, or close to parity with nylon. Prices of both 840 and 1680 nylon yarns are 92¢. Since, however, 1.6 pounds of rayon are used in tire cord for every pound of nylon, the effective price of the rayon is now 81.6¢ for 1650 denier and 91.2¢ for 1100 denier. Another rayon yarn price increase or a nylon yarn price cut would wipe out the differential for 1100 denier.

The increase was the second in four months. Last October rayon producers raised prices from ½¢ to 1½¢ per pound to counteract sizable losses. The latest increase was carried out for the same reason, or to quote American Enka, "because we haven't been able to make enough money at the price we've been selling it."

The American Enka spokesman said, "We have new improved yarns coming along and need a sufficient markup to finance research and development costs."

The latest increase was kicked off by Canadian producers, who raised prices of the 1100 denier 1¢ a pound, and 1650 denier 2¢ a pound.

Nylon producers are not expected to raise their prices to meet the rayon increase. Actually, there is at least a fair chance of a nylon price cut later this year. Instead of trying to meet price cuts, as they did last year, rayon yarn producers are expected to concentrate on improving quality. With the nylon producers also pushing for improved quality yarns, however, this fight may be a losing one.

The only event on the horizon which can really be termed hopeful for the rayon tire yarn manufacturers is development of the new Seiberling Rubber Co. tire, which uses two plies of rayon cord and two plies of nylon cord. If the new design is as successful as Seiberling hopes, it might lead to a 50-50 split of the tire cord market. At the moment, rayon holds the original-equipment passenger tire market, but nylon has the lion's share of the replacement passenger and truck tire markets.

According to *Textile Organon*, packaged production of high-tenacity rayon yarn during 1960 was 279.3 million pounds, compared with 332.2 million pounds in 1959. Total shipments were 274.1 million pounds, against 325.6 million pounds; and domestic shipments, 258.7 million pounds, contrasted with 322.5 million pounds. Stocks at the end of 1960 were 20.4 million pounds, compared with 15.2 million pounds on December 31, 1959, and 21.0 million pounds at the end of November, 1960.

For December packaged production was 22.1 million pounds, against 20.5 million in November; total shipments, 22.7 million pounds, against 20.6 million in November; and domestic shipments, 20.5 million, against 19.5 million.

RAYON PRICES

Tire Fabrics

1100/490/2	$0.69
1650/908/2	$0.58/.615

Tire Yarns

High-Tenacity	
1100/ 490	.51
1100/ 980	.51
1150/ 490, 980	.51
1230/ 490	.51
1650/ 980	.57
1875/ 980	.57
2200/ 980	.57
Super-High Tenacity	
1650/ 720	.57

NYLON PRICES

Tire Yarns

840/140	.92
1680/280	.92

Synthetic Rubber

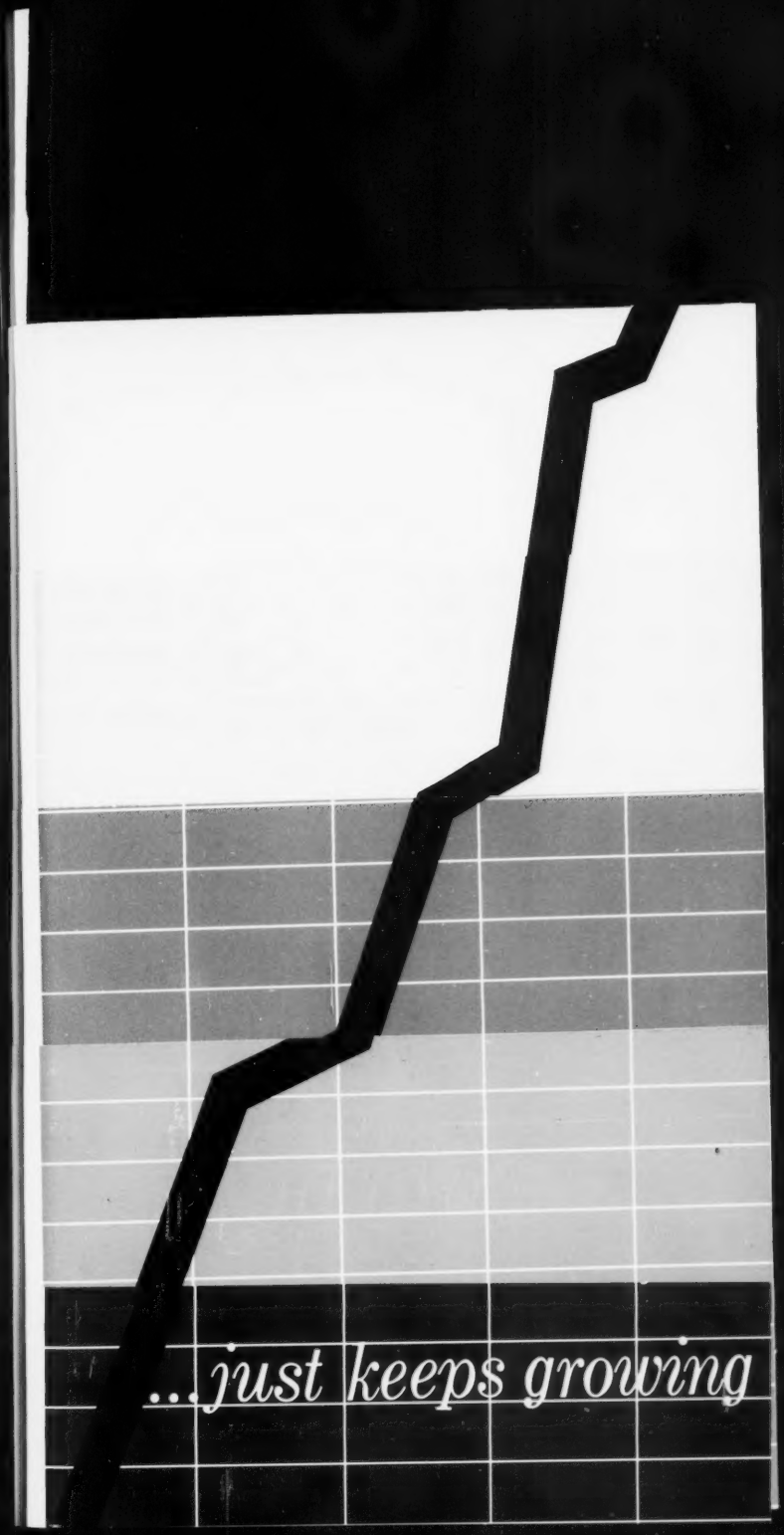
The announcement by Goodyear Tire & Rubber Co., Akron, O., that it will produce isoprene at its Beaumont, Tex., facility, presumably indicating that Natsyn (polyisoprene) will be made along with Budene (polyisoprene) when the plant goes on stream this fall, further clouded the already unclear picture on stereospecific rubbers.

Although a number of the major companies have developed polyisoprene rubbers, only Shell Chemical Co. up to now is actually producing polyisoprene in commercial quantities. The reason given is that polyisoprene is a duplicate of natural rubber and therefore will compete with natural solely on a basis of price. With the price of isoprene monomer rather high, indications were that polyisoprene could not compete in price.

However, Goodyear's decision to follow Shell's line of producing both the monomer and the polymer may mean a polyisoprene which can sell for less than natural rubber. Shell is selling polyisoprene for 27¢, compared with a little over 29¢ for RSS #1. This does not mean that polyisoprene is selling lower than natural, since only a small quantity of RSS #1 is sold compared with the lower grades. A typical tire compound would include little, if any, RSS #1. A 25¢ polyisoprene, on the other hand, would cause rubber users to take another look at their purchasing policies.

The polybutadiene picture is also unclear. Assuming that the main market of polybutadiene is in 50-50 blends with natural in truck-tire treads, the market is comparatively small. Only 30% of current United States consumption is in natural rubber, about 20% in truck tires. Assuming that polybutadiene can take more than half that market by replacing all-natural truck tires with 50-50 blends, the market is still limited. The big market is in passenger tires, and that brings polybutadiene into direct competition with SBR. Except for premium tires, that means a price of less than 24¢ and even lower in the case of oil-extended

(Continued on page 113)


...just keeps growing

1950 ... a new plant in
GREAT BRITAIN

1953

. . . a new plant in

CANADA

1957

. . . a new plant in

FRANCE

1959

. . . a new plant in

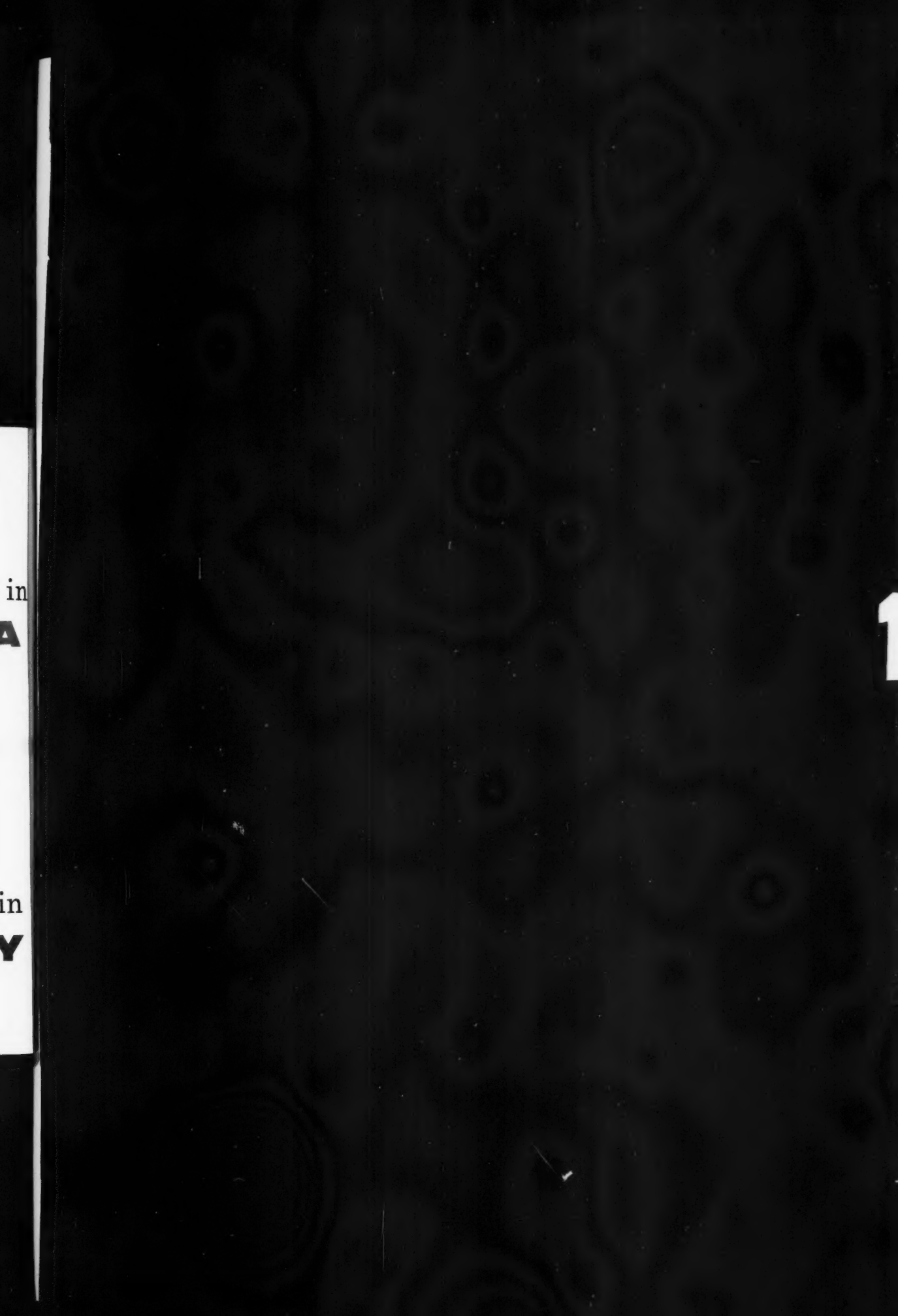
AUSTRALIA

(Jointly Owned)

1960

. . . a new plant in

ITALY



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...and growing

A new 30-million pound per year carbon black plant, now being built by Cabot near Buenos Aires, will be serving the fast-growing needs of Argentina and its neighbors within a year.

The new plant marks the latest step of Cabot Corporation to expand production facilities along an international front in order to provide faster, more economical service to the rubber industry throughout the world.

The new plant will be able to produce the complete range of Cabot blacks . . . blacks previously available only by import . . . including the new REGAL blacks, developed by Cabot research and produced by a new and exclusive manufacturing process from oil.

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Regal 300
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FURNACE:
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Vulcan 6 ISAF
Vulcan 3 HAF
Vulcan XC-72 ECF
Vulcan SC SCF
Vulcan C CF
Sterling* 99 FF
Sterling SO FEF
Sterling V GPF
Sterling L HMF
Sterling LL HMF
Sterling S SRF
Sterling NS SRF
Pelletex* SRF
Pelletex NS SRF
Sterling R SRF
Gastex* SRF

THERMAL:
Sterling FT
Sterling MT
Sterling MT-NS

CHANNEL:
Spheron* 9 EPC
Spheron 6 MPC

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- Cabot produces more different grades of carbon black than anyone else — and sells more — not only in the U.S. but throughout the world. On all six continents. In 58 different countries.
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Cabot Carbon Limited, 62 Brompton Road, London, S. W. 3, England
Cabot France S.A., 45, rue de Courcelles, Paris 8, France
Cabot Italiana S.p.A., Via Larga 19, Milano, Italy
Cabot Europa, 45, rue de Courcelles, Paris 8, France
Australian Carbon Black Pty. Limited, Millers Road, Altona, Victoria, Australia (jointly owned)

Printed in U.S.A. March 1961

market reviews

(*Continued from page 104*)

SBR. The only polybutadiene now on the market, the Phillips Chemical Co. product, sells for a little bit more than 30¢.

Just as important, perhaps, such a shift of emphasis to the passenger-tire field would put rubber manufacturers in competition with themselves, since those scheduled to make polybutadiene all manufacture SBR. However it turns out, the result should be better rubbers for the fabricator.

Along with greater production facilities of synthetic rubber, countries abroad are also increasing their consumption of synthetic. According to a survey issued by a French rubber trading firm, Safic-Alcan, France consumed 88,000 tons of synthetic in 1960, contrasted with 67,000 tons in 1959, while the use of natural dropped from 133,000 tons to 127,000. Firestone Tire & Rubber Co.'s synthetic plant at Port Jerome will be completed this fall, and Polymer Corp., Ltd., Sarnia, Ont., Canada, expects to complete a specialty rubbers plant at Strasbourg by the summer of next year. Scheduled capacity is 10,000 long tons.

Natural Rubber

If the price of RSS #1 should drop to 25¢ a pound, a typical tire compound using natural rubber would be about 22½¢ a pound, or less than the price of standard SBR, the Natural Rubber Bureau suggests.

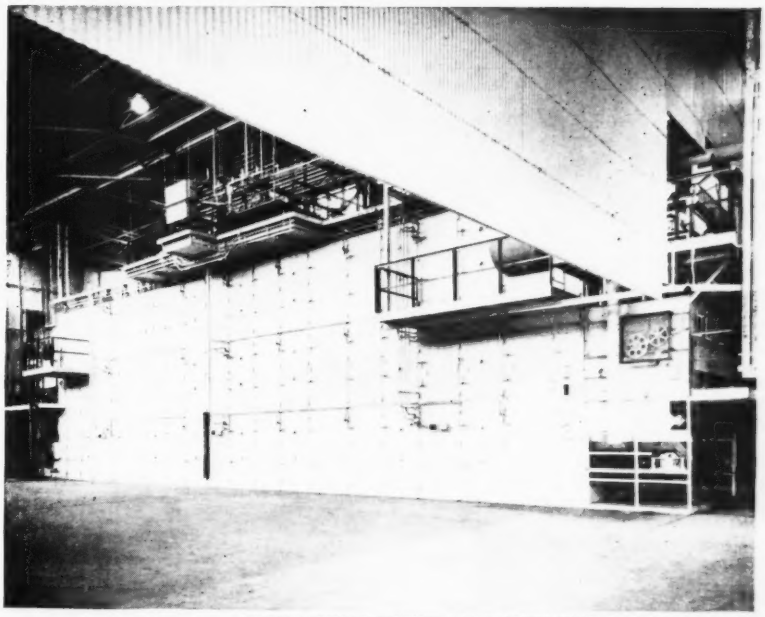
It notes that assuming a price of 28¢ for RSS #1, the tire might consist of 25% RSS #3 at 27¾¢, 25% RSS #4 at 27¼¢, 45% #3 Brown at 24¢, and 5% Standard Flat Bark at 18¾¢. This would give an average price of 25¢.

The figures overlook somewhat the price of oil-extended SBR, used for tread stocks. However, the fact is that RSS #1 was selling at 29.37¢ at the end of the January 16-February 15 period, slightly higher than the 29¢ at the end of the preceding period. Prices appear to have stabilized temporarily, and with the wintering season approaching in Malaya, no sudden changes are expected for a time.

In order to narrow the price advantage of SBR, natural rubber producers are planning research into oil-extended natural rubber and natural rubber black masterbatches, as well as on blending of natural and synthetic rubbers. Synthetic rubber can be extended by 30%, but natural can be extended by only 10 to 20%, according to natural rubber producers.

On the physical market, according to the Rubber Trade Association of New York, RSS #1 averaged 28.76¢ a pound in January and 29.13¢ during the January 16-February 15 period, compared with 28.76¢ in December and 29.13¢ in the December 16-January 15 period.

In One Space-Saving, Power-Saving, Labor-Saving Machine...



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Gas burners, safety certified of course, may be mounted on top of the dryer section for more efficient operation, easier servicing. Heat source for Sargent Dryers may also be oil, steam or electricity.

Shown above is a recently installed gas-fired, 3-pass synthetic rubber dryer with cooler. Only 2 gas burners are needed to bring this dryer up to working temperature in less than ten minutes.

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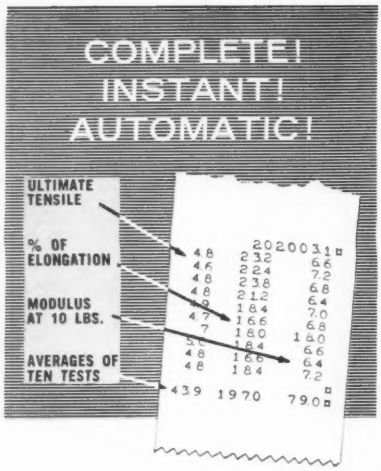
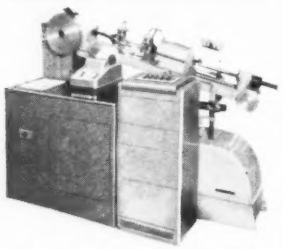


TIRE CORD TESTING *and* RECORDING



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SCOTT TESTERS

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market reviews

January sales on the New York Commodity Exchange totaled 8,370 long tons, against 7,390 long tons during December. There were 21 trading days in January and 23 in the January 16-February 15 period.

REX CONTRACT

1961	Jan. 20	Jan. 27	Feb. 3	Feb. 10
Jan.	27.75	——	——	——
Mar.	27.90	28.30	28.80	29.15
May	27.90	27.95	28.00	28.45
July	27.75	27.85	27.85	28.25
Sept.	27.75	27.85	27.85	28.20
Nov.	27.70	27.85	27.85	28.20
1962				
Jan.	27.65	27.80	27.85	28.10

NEW YORK OUTSIDE MARKET

	Jan. 20	Jan. 27	Feb. 3	Feb. 10
RSS #1	28.25	28.25	28.50	29.25
#2	28.13	28.13	28.37	29.13
#3	28.00	28.00	25.25	29.00
Pale Crepe				
#1 Thick	31.00	31.00	30.75	31.50
Thin	31.00	31.00	30.75	31.50
#3 Amber				
Blankets	24.50	24.25	23.50	24.13
Thin Brown Crepe	24.50	24.25	23.50	24.13
Standard Flat Bark	24.50	24.25	23.50	24.13
	19.25	19.25	18.75	19.50

Reclaimed Rubber

The reclaimed rubber market was very slow during the January 16-February 15 period, reflecting the reduced auto production schedule. Production for the first two months of this year is running about 15% behind that of the same period for 1960, an eastern reclaimer reported. Indications are that production will continue slow for a while, or until auto production revives.

The price of butyl inner tube reclaim is off a cent, from 17¢ a pound to 16¢.

RECLAIMED RUBBER PRICES

Whole tire, first line	$0.115
Third line	.1075
Inner tube, black	.17
Red	.22
Butyl	.16
Light carcass	.22
Mechanical, light-colored, medium gravity	.185
Black, medium gravity	.10

The above list includes those items or classes only that determine the price basis of all derivative reclaim grades. Every manufacturer produces a variety of special reclaims, in each general group separately featuring characteristic properties of quality, workability, and specific gravity, at special prices.

Latex

The recent improvement in the drum latex market has been maintained; and while turnover has not been substantial, it has been sufficient to help consolidate prices. The decline in prices over the past few months has caused a switch in purchase policies, since U. S. producers prefer the natural product at prices less than or equal to those of synthetic latices.

The bulk latex market is slightly steadier than in recent months, and it is believed that some sources of production are fairly well committed for shipment during the first half of the year.

Malaya produced 8,606 tons of liquid latex during December, compared with 7,865 tons in November. This figure brings the total for 1960 to 113,525 tons against 125,072 tons in 1959.

Prices for ASTM centrifuged concentrated natural latex, in tank-car quantities f.o.b. tank car, dropped to 33.23¢ per pound solids, February 15, compared with 35.23¢ on January 15. Synthetic latices prices were 26 to 40.24¢ for SBR; 37 to 57¢ for CR; and 45 to 60¢ for NBR.

(All figures in long tons, dry weight)

Type of Latex	Production	Imports	Consumption	Month-End Stocks
Natural				
Oct.	0	2,042	4,283	10,634
Nov.	0	*	4,338	9,284
SBR				
Oct.	9,063	——	7,371	10,000
Nov.	7,205	——	7,171	9,180
Neoprene				
Oct.	1,272	0	971	1,626
Nov.	1,169	0	914	1,798
Nitrile				
Oct.	1,176	0	1,118	1,999
Nov.	1,328	0	1,104	2,300

* Not available yet for period covered.

Scrap Rubber

With the reclaim market slow, the scrap rubber market was nearly at a standstill during the January 16-February 15 period. Prices remained unchanged for all grades.

	Eastern Points	Akron, O.
	Per Net Ton	
Mixed auto tires	$7.00/$11.00	$11.00
S.A.G. truck tires	nom.	nom.
Peeling, No. 1	nom.	25.00
2	nom.	nom.
3	nom.	nom.
	(¢ per Lb.)	
Auto tubes, mixed	4.00	4.00
Black	5.75	5.75
Red	nom.	nom.
Butyl	5.75	5.75

■

OBITUARY

Charles A. Hemingway

Charles A. (Judge) Hemingway, president of Westwood Chemical Co., Cleveland, O., died January 23.

A member of the rubber industry for more than 30 years, he had also been associated with Firestone Tire & Rubber Co., Akron, O.

Burial took place at Knollwood Mausoleum on January 25.

Surviving are his wife and a son.

on land Truck tarps of coated nylon combine lightness, durability and watertightness. "Welkote" nylon base fabric by Wellington Sears.

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Synthetic Rubbers and Latices*

Monomers

11-80, 100, 200, 112-3 Triols	lb.	$0.225	
11-300	lb.	.265	
-400	lb.	.325	
Acrylonitrile	lb.	.27	
Butadiene	lb.	.15	
Dow Styrene	lb.	.12	
H99, N99	lb.	.205	
RG	lb.	.17	
Vinyltoluene	lb.	.17	
Hylene M	lb.	1.25	/ $2.75
M-50	lb.	.86	/ 2.36
T	lb.	.85	/ 2.41
TM	lb.	.70	/ 2.26
-65	lb.	.75	/ 2.31
Isobutylene	gal.	.38	
Isoprene	lb.	.25	
Mondur-C	lb.	1.05	
Multron R-2	lb.	.54	
P200	lb.	.23	
Rohm & Haas ethyl acrylate	lb.	.34	.36
Glacial methacrylic acid	lb.	.40	.425
Methyl acrylate	lb.	.37	.39
Methylacrylate	lb.	.29	.31

Shortstops

4P Mercaptan	lb.	.27	/ .31
DDM	lb.	.94	/ .975
Mercaptan 174	lb.	.38	/ .50
Sharstop 204	lb.	.38	/ .42
268	lb.	.52	/ .53
Tecquinol	lb.	.825	/ .845
Thiostop K	lb.	.50	/ .53
N	lb.	.38	/ .47
Vulnapol KM	lb.	.52	/ .56
XM	lb.	.38	/ .42
Wingstop B	lb.	.38	

Acrylic Types

Acrylon BA-15	lb.	1.25[a]	
EA-5	lb.	1.00[a]	
Hycar 4021	lb.	1.34[c]	/ 1.35[c]
4501	lb.	.72[c]	/ .78[c]

Latices

Hycar 2600 X 30, 2600 X 83, 2600 X 84	lb.	.48[c]	/ .54[c]
2601	lb.	.50	/ .56[c]
2671	lb.	.46[c]	/ .52[c]

Butadiene Types (BR†)

Cis-1	lb.	.35[b]	/ .50[b]

Cold BR Latex

Pliolite Latex 2104			.325

Fluorocarbon Types

Fluorel KF-2141	lb.	10.00	10.25
Kel-F Elastomer	lb.	15.00	16.00
5500, 820 (Latex)	lb.	15.00	17.15
Viton A, AHV, B	lb.	10.00	10.25

Isobutylene Types (IIR)

Enjay Butyl 035, 065, 150, 215, 217, 218, 325			.23[a]
165, 268, 365			.24[a]
Hycar 2202		.65[c]	/ .75[c]
Polysar Butyl 100, 200, 300, 400			.245[c]
101			.2775[a]
301			.255[c]
Vistanex LM			.45[a]
MM			.35[a]

Neoprene Types (CR)

Neoprene Type AC, AD, CG		.55[a]	/ .575[a]
FB		.65[a]	/ .675[a]
GN, GN-A, WB, WX		.41[a]	/ .435[a]
GRT, S		.42[a]	/ .445[a]
KNR		.75[a]	/ .775[a]
W, WHV		.39[a]	/ .415[a]
WD		.45	/ .475
W-M1		.40[a]	/ .415[a]
WRT		.45[a]	/ .475[a]

Latices

Neoprene Latex 571, 842-A		.37[a]	/ .47[a]
572		.39[a]	/ .49[a]
60, 601-A		.40[a]	/ .50[a]
635		.41[a]	/ .51[a]
400, 650		.42[a]	/ .52[a]
735, 736		.38[a]	/ .48[a]
750		.39[a]	/ .49[a]
950		.47[a]	/ .57[a]

Nitrile Types (NBR)

Butaprene NF			.49[b]
NH			.65[b]
NL			.50[b]
NXM			.58[b]
Chemigum, N1NS			.64[b]
N3NS, N5			.58[b]
N6, N-6B, N7, N8			.50[b]
N600			.50[b]

Hycar 1001, 1041		$0.58[c]	/ $0.59[a]
1002, 1042, 1043, 1052, 1053, 1312		.50[c]	/ .51[c]
1014		.60[c]	/ .61[c]
1072		.64[c]	/ .65[c]
1411		.62[c]	/ .63[c]
1432, 1441		.59[c]	/ .60[c]
Paracril, AJ		.485[c]	/ .495[c]
B, BJ, BJLT, BLT		.50[c]	/ .51[c]
C CLT		.58[c]	/ .59[c]
CV		.63[c]	/ .64[c]
D		.65[c]	/ .66[c]
OZO		.45[b]	/ .46[b]
18-80		.60[c]	/ .61[c]
Polysar Krynac 800, 802, 803			.50[c]
801			.58[c]

Latices

Butaprene N-300			.46[b]
N-400, N-401			.54[b]
Chemigum 200			.49[b]
235 CHS, 236			.54[b]
245 B, 245 CHS, 246, 247, 248			.46[b]
Hycar 1512, 1552, 1562, 1577		.45[c]	/ .52[c]
1551, 1561, 1571		.53[c]	/ .60[c]
1852		.46[c]	/ .52[c]
Nitrex 2612		.45[a]	/ .52[a]
2616		.53[a]	/ .60[a]
2619		.52[a]	/ .59[a]
2620, 2625		.45[a]	/ .52[a]
Tylac 640,650		.45[c]	/ .52[c]
750		.49[c]	/ .56[c]
850		.53[c]	/ .60[c]
1640,1650		.54[c]	/ .61[c]

Polyethylene Type

Hypalon 20	lb.		.47[a]
30	lb.		.60[a]
40	lb.		.50[a]

Polysulfide Type

Thiokol LP-2, -3, -31, -32, -33			.96[a]
-8			1.35[a]
-205			4.00[a]
Type-A			.50[a]
FA			.69[a]
ST			1.25[a]

Latices

Thiokol Latex (dry wt.) Type MX			.80[a]
WD-2			1.25[a]
-6		.80[a]	/ 1.25[a]

Silicone Types

GE (compounded)		2.29[c]	/ 4.90[c]
Silicone gum		3.85[c]	/ 4.55[c]
Silastic (compounded)		2.95[b]	/ 3.50[b]
(Partly compounded)		3.15[b]	/ 3.60[b]
(Uncompounded)		4.05[b]	/ 4.35[b]
LS-53		12.00	/ 16.30
Union Carbide (compounds)		2.35[b]	/ 3.20[b]
(Gums)		3.85[b]	/ 4.25[b]

Styrene Types (SBR)‡

Hot SBR

Ameripol 1000, 1001, 1006, 1007		.241[c]	/ .247[c]
1002		.2435[c]	/ .2495[c]
1006 Crumb		.2475[c]	/ .2535[c]
1009		.2475[c]	/ .2535[c]
Crumb		.259[c]	/ .265[c]
1011		.2475[c]	/ .2535[c]
1012		.2425[c]	/ .2485[c]
Crumb		.249[c]	/ .255[c]
1013		.241[c]	/ .247[c]
Crumb		.2615[c]	/ .2675[c]
ASRC 1004, 1006		.241[c]	/ .2475[c]
1009		.2475[c]	/ .2535[c]
1018		.27[c]	/ .276[c]
1019		.265[c]	/ .271[c]
Copo 1006			.241[c]
FR-S 1000, 1001, 1004, 1006		.241[c]	/ .247[c]
1007		.241[c]	/ .247[c]
1009		.2475[c]	/ .2535[c]
1010		.26[c]	/ .266[c]
1012		.2425[c]	/ .2485[c]
1013		.241[c]	/ .247[c]
Crumb		.2615[c]	/ .2675[c]
1014		.281[c]	/ .287[c]
141		.28[c]	/ .286[c]
181		.241[c]	/ .247[c]
Naugapol 1016, 1019		.265[b]	/ .27[b]
1015		.35[b]	/ .355[b]
1018		.27[b]	/ .275[b]
1022		.305[b]	/ .31[b]
1023		.33[b]	/ .335[b]
6003		.27[b]	/ .275[b]
Philprene 1000, 1006, 6701		.241[b]	/ .247[b]
1009		.2475[b]	/ .2535[b]
1018		.27[b]	/ .276[b]
1019		.265[b]	/ .271[b]
Plioflex 1006		.241[c]	/ .247[c]
Polysar S-630		.241[c]	/ .247[c]
S-X-371		.255[c]	/ .261[c]
S-1000, -1006, -1013			.23[a]
-1002, -1011			.2325[a]
-1009			.24[a]
Synpol 1000, 1001, 1006, 1007, 1013, 1061		.241[b]	/ .247[b]
1002		.2435[b]	/ .2495[b]
1009		.2475[b]	/ [illegible]
Synpol 1012		$0.2425[b]	/ $0.2485[b]
8000		.241[b]	/ .247[a]
X-274		.255[c]	/ .261[c]

Hot SBR Black Masterbatch

Philprene 1100			.194
1104			.190[b]
S-1100			.185[a]

Hot SBR Latices

Copo 2000			.2775
FR-S 2000, 2001		.2725[c]	/ .3425
2002		.35[c]	/ .36[c]
2003, 2004		.305[c]	/ .36[c]
2006		.29[c]	/ .382[c]
Naugatex 2000, 2001		.275[a]	/ .355[a]
2002		.30[a]	/ .37[a]
2006		.29[a]	/ .42[a]
Pliolite Latex 2000, 2001			.282[b]
2076			.295[c]
Polysar Latex II			.29[c]
IV			.2775
S-2000, 2006			.26[a]

Cold SBR

Ameripol 1500, 1501, 1502, 4600, 4601		.241[c]	/ .247[c]
ASRC 1500, 1502		.241[c]	/ .247[c]
1503		.2625[c]	/ .2685[c]
3105, 3106		.241[c]	/ .247[c]
3110		.26[c]	/ .266[c]
C-102			.23[a]
Copo 1500, 1502, 1507, 1510			.241[c]
1505-NS			.261[c]
FR-S 1500, 1502, 146, 179		.241[c]	/ .247[c]
127		.26[c]	/ .266[c]
Gentro 1500			.241[c]
Naugapol 1503		.2625[b]	/ .2675[b]
1504		.35[b]	/ .355[b]
6100		.32[b]	/ .325[b]
Philprene 1500, 1502		.241[b]	/ .247[b]
1503		.2625[b]	/ .2685[b]
6630		.251[b]	/ .257[b]
6631		.241[b]	/ .247[b]
Plioflex 1500C, 1502, 1507, 1510		.241[c]	/ .247[c]
Polysar Kryflex 200			.251[c]
252			.27[c]
Krylene NS			.241[a]
SS-250, SS-250-Flake			.2875[a]
S-1500, S-1502			.23[a]
1509			.23[a]
Synpol 1500, 1502, 1551, 8103		.241[b]	/ .247[b]

Cold SBR Black Masterbatch

Ameripol 1605		.19[c]	/ .196[c]
4651		.177[c]	/ .183[c]
4659		.182[c]	/ .188[c]
4660		.187[c]	/ .193[c]
4664		.1845[c]	/ .1905[c]
4667		.208[c]	/ .214[c]
B-129			.1960[c]
-134			.1900[c]
-172			.1825[c]
Baytown 1600, 1601, 1602			.193[b]
8675, 8677			.182[b]
8676			.1876[b]
8678			.208[b]
8679			.2022[b]
8680			.1775[b]
8681			.1835[b]
Carbomix 1606			.182[b]
1608			.1845[b]
1609			.208[b]
1811			.1569[b]
CB-102			.185[a]
Gentro-Jet 9152			.208
9153			.182
9154			.1845
Philprene 1601		.193[b]	/ .199[b]
1603		.196[b]	/ .202[b]
1605		.19[b]	/ .196[b]
1606		.182[b]	/ .188[b]
1608, 6662		.1845[b]	/ .1905[b]
1609		.208[b]	/ .214[b]
6655		.194[b]	/ .20[b]
S-1600, -1602			.1825[a]
-1605			.18[a]
-1606, -1607			.175[a]
-7652			.1875[a]
Synpol 8151		.182[b]	/ .188[b]
8152		.186[b]	/ .192[b]

Cold SBR Oil Masterbatch

Ameripol 1705		.2035[c]	/ .2095[c]
1707, 1708		.191[c]	/ .197[c]
1710, 1712		.1885[c]	/ .1945[c]
4700		.175[c]	/ .181[c]
ASCR 1703		.206[c]	/ .212[c]
1708		.191[c]	/ .197[c]
1712		.1885[c]	/ .1945[c]
1713		.175[c]	/ .181[c]
Copo 1712			.1885[c]
1713			.175[c]
1714			.1725[c]
1773			.206[c]
1778			.191[c]
FR-S 1703		.206[c]	/ .212[c]
1710		.1885[c]	/ .1945[c]
1712		.1885[c]	/ .1945[c]
123		.196[c]	/ .202[c]
154, 155		.1885[c]	/ .1945[c]
173		.206[c]	/ .212[c]
178		.191[c]	/ .197[c]
Gentro 1712			.1885[c]
Philprene 1703		.206[b]	/ .212[b]
1708		.191[b]	/ .197[b]
1712		.1885[b]	/ .1945[b]

(*Continued on page 128*)

[a] Freight extra.
[b] Minimum freight allowed.
[c] Freight prepaid.
* Prices are per pound carload of tank-car dry weight unless otherwise specified.
† BR—Butadiene rubber.
‡ SBR—Styrene-butadiene rubber.

an important announcement for every user of SBR LATEX

a new source...and a new service in Hot Type Custom Modifications

RC proudly introduces its synthetic latices! Available immediately to standard specifications and in custom modifications to meet your most exacting needs. For example, IR-S 2000 is available with improved mechanical stability...or low soap content ...or small or large particle size, etc. For imaginative, advanced rubber chemistry, rely on RC... big enough to fill your requirements in any quantity...yet interested enough to render personal service to meet the individual needs of all buyers of SBR latex.

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NEW RC HOT TYPES

- ☐ **IR-S 2000**
- ☐ **IR-S 2002**
- ☐ **IR-S 2001**
- ☐ **IR-S 2000** *(concentrated with varying viscosities)*

PLUS CUSTOM MODIFICATIONS:
(please specify your needs)

Rubber Corporation of America
New South Road, Hicksville 10, New York

Company Name_____

Address_____

City_____ Zone____ State_____

Attention of_____

READY...RELIABLE... RC *SERVING AMERICAN INDUSTRY SINCE 1930*

RUBBER CORPORATION OF AMERICA
New South Road, Hicksville 10, New York
Sales Offices: New York • Chicago • Boston

Compounding Ingredients*

Abrasives

Pumicestone, powdered	lb.	$0.0363/	$0.065
Rottenstone, domestic	lb.	.03 /	.04
Shelblast	ton	80.00 /	165.00
Walnut Shell Grits	ton	50.00 /	160.00

Accelerators

A-1 (Thiocarbanilide)	ton	.74 /	.81
A-32	ton	.66 /	.80
A-100	lb.	.52 /	.66
Accelerator B	lb.	.92	
49	lb.	.60 /	.61
52	lb.	1.14	
57, 62, 67, 77	lb.	1.04	
66	lb.	4.25	
89	lb.	1.20	
108	lb.	.92	
552	lb.	2.25	
808	lb.	.66 /	.68
833	lb.	1.17 /	1.19
Altax	lb.	.54 /	.56
Amax	lb.	.75 /	.77
No. 1	lb.	.71 /	.73
Arazate	lb.	2.25	
Beutene	lb.	.66 /	.68
Bismate	lb.	3.00	
B-J-F	lb.	.27 /	.32
Butazate	lb.	1.04	
Butyl Eight	lb.	1.10 /	1.35
Namate	lb.	.45 /	.50
Zimate	lb.	1.04	
Ziram	lb.	.89 /	1.04
Captax	lb.	.44 /	.46
Conac S	lb.	.71 /	.73
C-P-B	lb.	1.95	
Cumate	lb.	1.45	
Cydac	lb.	.71 /	.73
Cyuram DS, powder	lb.	1.14	
Pellets	lb.	1.14	
MS, powder	lb.	1.14	
Pellets	lb.	1.14	
Cyzate B, E	lb.	.87 /	.89
Delac-S	lb.	.71 /	.73
DIBS	lb.	.85 /	.87
Dipac	lb.	.85	
DOTG (diorthotolylguanidine)			
Cyanamid	lb.	.69 /	.70
Du Pont	lb.	.71 /	.72
DPG (diphenylguanidine)			
Cyanamid	lb.	.51 /	.52
Monsanto	lb.	.51 /	.57
El-Sixty	lb.	.62 /	.64
Ethazate	lb.	1.04	
50-D	lb.	.87 /	.89
Ethyl Seleram	lb.	3.00	
Thiurad	lb.	1.04	
Thiuram	lb.	1.04	
Tuads	lb.	1.04	
Tuex	lb.	1.04	
Zimate	lb.	1.04	
Ziram	lb.	.89 /	1.04
Ethylac #650	lb.	.93 /	.95
Guantal	lb.	.62 /	.64
Hepteen Base	lb.	1.85	
Ledate	lb.	1.04	
MBT (2-mercaptobenzothiazole)			
American Cyanamid	lb.	.44 /	.46
Du Pont	lb.	.44 /	.46
Naugatuck	lb.	.44 /	.49
-XXX, Cyanamid	lb.	.55 /	.57
MBTS (mercaptobenzothiazyl disulfide)			
Cyanamid	lb.	.54 /	.56
Du Pont	lb.	.54 /	.56
Naugatuck	lb.	.54 /	.56
-W Cyanamid	lb.	.60 /	.62
Merac #225	lb.	.75 /	1.05
Mertax	lb.	.55 /	.57
Methazate	lb.	1.04	
Methyl Thiuram	lb.	1.14	
Tuads	lb.	1.14	
Zimate	lb.	1.04	
Monex	lb.	1.14	
Mono-Thiurad	lb.	1.14	
2-MT (2-mercaptothiazoline)			
Cyanamid	lb.	.88 /	.90
Du Pont	lb.	1.00	
NA-22	lb.	1.05	
NOBS No. 1	lb.	.71 /	.73
Special	lb.	.75 /	.77
O-X-A-F	lb.	.55 /	.57
Pennac SDB	lb.	.45 /	.48
Pentex	lb.	1.24	
Flour	lb.	.30	
Permalux	lb.	2.25	
Phenex	lb.	.52 /	.59
Pip-Pip		2.07	
Polyac Pellets	lb.	1.85	
R-2 Crystals	lb.	4.35	
Rotax	lb.	.55 /	.57
RZ-50, -50B	lb.	1.00	
S.A. 52	lb.	1.14	
57, 62, 67, 77	lb.	1.04	
66	lb.	3.00	
Santocure	lb.	.71 /	.73
NS	lb.	.71 /	.73
Selenacs	lb.	3.00	
SPDX-GH	lb.	.69 /	.74
GL	lb.	1.20 /	1.34
Sulfads	lb.	1.98	
Tellurac	lb.	1.30 /	1.55
Tepidone	lb.	$0.45	
Tetrone A	lb.	1.98	
Thiates	lb.	.88 /	$1.25
Thiofide	lb.	.54 /	.56
Thionex	lb.	1.14	
Thiotax	lb.	.44 /	.46
Thiurad	lb.	1.14	
Thiuram E	lb.	1.04	
M	lb.	1.14	
Trimene	lb.	.56 /	.58
Base	lb.	1.03 /	1.06
Tuex	lb.	1.14	
Ultex	lb.	1.00 /	1.10
Unads	lb.	1.14	
Ureka Base	lb.	.66 /	.73
Vulcacure NB	lb.	.45	
NS	lb.	.75 /	1.05
T.M.D.	lb.	1.14	
ZB, ZE, ZM	lb.	.85 /	.89
Z-B-X	lb.	2.45	
Zenite	lb.	.54 /	.56
A	lb.	.69 /	.71
AM	lb.	.76 /	.78
Special	lb.	.55 /	.57
Zetax	lb.	.55 /	.57
Zimate	lb.	1.04	
ZMBT	lb.	.55 /	.57

Accelerator-Activators, Inorganic

Lime, hydrated	ton	21.96	
Litharge, comml.	lb.	.1425/	.1575
Eagle, sublimed	lb.	.1435	
National Lead, sublimed	lb.	.1585	
Red lead, comml.	lb.	.185 /	.195
Eagle	lb.	.1475	
National Lead	lb.	.1625/	.1645
PRD-90	lb.	.38 /	.50
White lead, carbonate	lb.	.19 /	.20
Eagle	lb.	.17 /	.18
National Lead	lb.	.18 /	.19
Silicate	lb.	.1725/	.1825
Eagle	lb.	.1425	
National Lead	lb.	.165 /	.175
Zinc oxide, comml.†	lb.	.145 /	.155

Accelerator-Activators, Organic

Aktone	lb.	.2125/	.2325
Barak	lb.	.65	
Capital 170	lb.	.20 /	.25
171	lb.	.1425/	.1925
225, 258, 710	lb.	.14 /	.19
261	lb.	.155 /	.18
262	lb.	.16 /	.185
263	lb.	.1775/	.2025
270	lb.	.1175/	.1425
Curade	lb.	.57 /	.59
D-B-A	lb.	1.95	
Emery 600	lb.	.13 /	.18
G-M-F	lb.	2.60 /	2.65
PDD-70	lb.	2.70 /	3.00
PGD-25	lb.	1.25 /	1.50
Groco 30	lb.	.1325/	.1825
Guantal	lb.	.62 /	.64
Hyfac 410	lb.	.1475/	.1725
430	lb.	.17 /	.1950
431	lb.	.2025/	.2275
Hystrene S-97	lb.	.1925/	.2175
T-45	lb.	.1638/	.19
T-70	lb.	.1738/	.20
Industrene B	lb.	.1263/	.1525
R	lb.	.1138/	.14
158	lb.	.1313/	.1575
254	lb.	.1413/	.1675
262	lb.	.1513/	.1775
Laurex	lb.	.37 /	.39
MODX	lb.	.295 /	.345
NA-22	lb.	1.05	
PND-70	lb.	1.35 /	1.60
Oleic acid, comml.	lb.	.185 /	.225
Emersol 210 Elaine	lb.	.1475/	.1975
Groco 2, 4, 8, 18	lb.	.1375/	.1875
Welcoline	lb.	.21 /	.42
Plastone	lb.	.27 /	.30
Polyac	lb.	1.85	
Ridacto	lb.	.25 /	.26
Seedine	lb.	.1485/	.1703
Stearex Beads	lb.	.1488/	.1588
Stearic acid			
Emersol 120	lb.	.165 /	.19
150	lb.	.1925/	.2175
Hydrofoil 51	lb.	.09	
Hydrogenated, rubber grd.			
Groco 56	lb.	.115 /	.14
Rufat 75	lb.	.1062/	.1325
Single pressed, comml.	lb.	.1475/	.1675
Emersol 110	lb.	.1475/	.1725
Groco 53	lb.	.1525/	.1775
Wilmar 253	lb.	.1525/	.1775
Double pressed, comml.	lb.	.1525/	.1725
Groco 54	lb.	.1575/	.1825
Wilmar 254	lb.	.1575/	.1825
Triple pressed, comml.	lb.	.175 /	.195
Groco 55	lb.	.175 /	.20
Wilmar 255	lb.	.1875/	.2075
Sterene 60-R	lb.	.09 /	.1075
Tonox	lb.	.54 /	.56
Vimbra	lb.	.32 /	.385
Vulklor	lb.	.88 /	.98
Wilmar 110	lb.	.17 /	.22
434	lb.	.1425/	.1925
Zinc stearate, comml.	lb.	.39 /	.44

Antioxidants

AgeRite Alba	lb.	$2.40 /	$2.50
Gel	lb.	.70 /	.72
H. P.	lb.	.79 /	.81
Hipar	lb.	1.05 /	1.07
Powder	lb.	.57 /	.59
Resin	lb.	.88 /	.90
D	lb.	.57 /	.59
Spar	lb.	.57 /	.59
Stalite	lb.	.57 /	.59
S	lb.	.57 /	.59
Superlite	lb.	.57 /	.59
White	lb.	1.50 /	1.60
Akroflex C	lb.	.85 /	.87
CD	lb.	.79 /	.81
Albasan	lb.	.69 /	.73
Allied AA 1144	lb.	.23 /	.24
AA-1177	lb.	.155 /	.165
Aminox	lb.	.57 /	.59
Antioxidant 425	lb.	2.47 /	2.50
2246	lb.	1.50 /	1.53
Antisol	lb.	.23 /	.24
Antisun	lb.	.15 /	.51
Antox	lb.	.59 /	.61
Aranox	lb.	3.25	
Betanox Special	lb.	.94 /	.96
B-L-E, -25	lb.	.57 /	.59
Burgess Antisun Wax	lb.	.185	
B-X-A	lb.	.55 /	.60
CAO-1	lb.	.37 /	.86
-5	lb.	1.49 /	1.63
Copper Inhibiter X-872-L	lb.	2.01	
D-B-P-C	lb.	.54 /	1.00
Deenax	lb.	.95	
Flectol H	lb.	.57 /	.59
Flexamine	lb.	.79 /	.81
Heliozone	lb.	.31 /	.32
Ionol	lb.	.91 /	1.65
Microflake	lb.	.20 /	.24
Naugawhite	lb.	.57 /	.59
NBC	lb.	1.67	
Neozone A	lb.	.64 /	.66
C	lb.	.86 /	.88
D, Special	lb.	.57 /	.59
Nevastain A	lb.	.51 /	.61
B	lb.	.51 /	.70
Nonox CI	lb.	1.50 /	1.67
WSL	lb.	1.50 /	1.60
WSP	lb.	1.47 /	1.60
Octamine	lb.	.57 /	.59
PDA-10	lb.	.46 /	.48
Pennox A, C, D	lb.	.57 /	.59
B	lb.	.67 /	.69
Permalux	lb.	2.25	
Polygard	lb.	.57 /	.59
Polylite	lb.	.55 /	.60
Protector	lb.	.41	
Rio Resin	lb.	.70 /	.72
Santoflex			
75	lb.	1.01 /	1.03
AW	lb.	.71 /	.73
DD	lb.	.57 /	.59
Santovar A	lb.	1.55 /	1.57
Santowhite Crystals, Powd.	lb.	1.55 /	1.57
L	lb.	.57 /	.59
MK	lb.	1.25 /	1.27
Stabilite	lb.	.55 /	.59
Alba	lb.	.72 /	.79
L	lb.	.60 /	.64
White	lb.	.52 /	.60
Powder	lb.	.41 /	.47
Styphen I	lb.	.51 /	.55
Sunolite #100	lb.	.21 /	.23
#127	lb.	.17 /	.19
Sunproof-713	lb.	.26 /	.27
Improved	lb.	.25 /	.26
Jr.	lb.	.22 /	.23
Tenamene 3	lb.	.91 /	1.05
Thermoflex A	lb.	1.05 /	1.07
Tonox	lb.	.54 /	.59
Velvapex 51-250	lb.	.40	
V-G-B	lb.	.75 /	.80
Wing-Stay S, T	lb.	.55 /	.67
Zalba	lb.	1.10	
Special	lb.	.85	
Zenite	lb.	.52 /	.54

Antiozonants

Eastozone 30, 31	lb.	1.05 /	1.09
32	lb.	1.15 /	1.20
Flexone 3-C	lb.	2.00	
6-H	lb.	1.25 /	1.27
Nonox ZA	lb.	1.99 /	2.00
Santoflex AW	lb.	.71 /	.73
Tenamene 30, 31	lb.	1.24 /	1.28
Tysonite	lb.	.30 /	.307
UOP 88, 288	lb.	1.05 /	1.07
Wing-Stay 100	lb.	1.00 /	1.08

Antiseptics

Copper naphthenate, 6-8%	lb.	.245	
Pentachlorophenol	lb.	.22 /	.30
Resorcinol, technical	lb.	.775 /	.785
Zinc naphthenate, 8-10%	lb.	.245 /	.30

Blowing Agents

Ammonium bicarbonate	lb.	.07 /	.09
Carbonate	lb.	.16	

* Prices, in general, are f.o.b. works. Range indicates grade or quantity variations. No guarantee of these prices is made. Spot prices should be obtained from individual suppliers.

† For trade names, see Color—White, Zinc Oxides.

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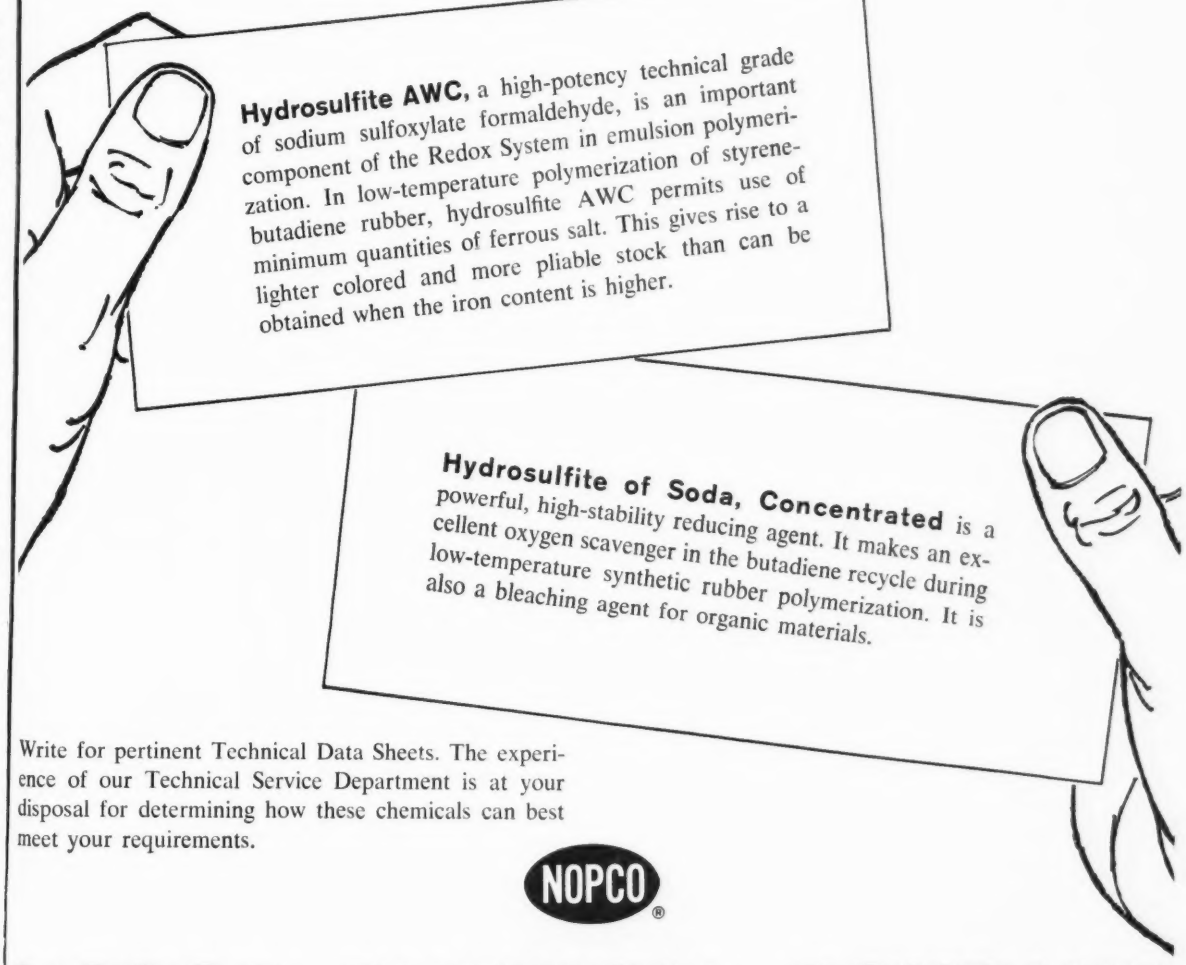
HIGH-POTENCY HIGH-PURITY POLYMERIZATION AGENTS



Hydrosulfite AWC, a high-potency technical grade of sodium sulfoxylate formaldehyde, is an important component of the Redox System in emulsion polymerization. In low-temperature polymerization of styrene-butadiene rubber, hydrosulfite AWC permits use of minimum quantities of ferrous salt. This gives rise to a lighter colored and more pliable stock than can be obtained when the iron content is higher.

Hydrosulfite of Soda, Concentrated is a powerful, high-stability reducing agent. It makes an excellent oxygen scavenger in the butadiene recycle during low-temperature synthetic rubber polymerization. It is also a bleaching agent for organic materials.

Write for pertinent Technical Data Sheets. The experience of our Technical Service Department is at your disposal for determining how these chemicals can best meet your requirements.

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Manufacturing Licensees Throughout the World

Blowing Agent 81105	lb.	$0.32 /	$0.35
Celogen	lb.	1.95	
-80	lb.	1.60	
-AZ	lb.	1.92	
Kempore R-125	lb.	1.92	
Opex 40	lb.	.72	
PL-80	lb.	1.44	
Sodium bicarbonate	100 lbs.	2.55 /	3.85
Carbonate, tech.	100 lbs.	1.35 /	5.52
Sponge Paste	lb.	.20	
Unicel ND	lb.	.72	
NDX	lb.	1.44	
S	lb.	.20	
Vulcacel BN	lb.	1.36 /	1.51
BMC	lb.	.68 /	.79

Bonding Agents

Braze	gal.	6.00 /	9.00
Cover cement	gal.	2.50 /	4.00
Chemlok 201, 203	gal.	5.00 /	7.50
220	gal.	9.25 /	12.00
401	gal.	11.70 /	14.40
602	gal.	25.00 /	26.00
607	gal.	18.00	
614	lb.	4.35 /	4.75
Flocking Adhesive RFA17, RFA22, RFA25	lb.	.50	
G-E Silicone Paste SS-15	lb.	4.52 /	5.10
SS-64	lb.	3.65 /	6.75
-67 Primer	lb.	7.50 /	12.50
Gen-Tac Latex	lb.	.70 /	.805
Hylene M	lb.	1.25 /	2.75
M-50	lb.	.86 /	2.36
Kalabond Adhesive	gal.	6.50 /	10.00
Tie Cement	gal.	2.00 /	5.60
Thixons	gal.	1.48 /	12.00
Ty Ply, BN, Q. S, UP, 3640	gal.	6.75 /	8.00
BC	gal.	4.50 /	6.00
RC	gal.	3.75 /	5.00

Brake Lining Saturants

BRT 3	lb.	.018 /	.0265
Resinex L-S	lb.	.0225/	.03

Carbon Blacks‡

Conductive Channel—CC

Continental R-40	lb.	.26 /	.35
Kosmos/Dixie BB	lb.	.23 /	.30
Texas MC-74-BD	lb.	.26 /	.35
Voltex	lb.	.18 /	.315

Easy Processing Channel—EPC

Continental AA	lb.	.08 /	.1625
Kosmobile 77/Dixiedensed 77	lb.	.085 /	.1625
Micronex W-6	lb.	.08 /	.1625
Spheron #9	lb.	.085 /	.1625
Texas E	lb.	.08 /	.1625
Witco #12	lb.	.08 /	.1625
Wyex EPC	lb.	.08 /	.1625

Medium Processing Channel—MPC

Arrow MPC	lb.	.08 /	.1625
Continental A	lb.	.08 /	.1625
Kosmobile S-66/Dixiedensed S-66	lb.	.085 /	.1625
Micronex Standard	lb.	.08 /	.1625
Spheron #6	lb.	.085 /	.1625
Texas M	lb.	.08 /	.1625
Witco #1	lb.	.08 /	.1625

Conductive Furnace—CF

Aromex CF	lb.	.0875/	.155
Continex CF	lb.	.11 /	.17
Vulcan C	lb.	.110 /	.185
SC	lb.	.18 /	.255
XC-72	lb.	.25 /	.34

Fast Extruding Furnace—FEF

Arovel FEF	lb.	.0625/	.135
Continex FEF	lb.	.0625/	.135
Kosmos 50/Dixie 50	lb.	.0675/	.135
Philblack A	lb.	.0675/	.135
Statex M	lb.	.0625/	.135
Sterling SO	lb.	.0675/	.135

Fine Furnace—FF

Statex B	lb.	.0675/	.14
Sterling 99	lb.	.0725/	.14

High Abrasion Furnace—HAF

Aromex HAF	lb.	.0725/	.145
Continex HAF	lb.	.0725/	.145
Kosmos 60/Dixie 60	lb.	.0775/	.145
Philblack O	lb.	.0775/	.145
Statex R	lb.	.0725/	.145
Vulcan #3	lb.	.0775/	.145

Intermediate Super Abrasion Furnace—ISAF

Aromex ISAF	lb.	.0875/	.16
Continex ISAF	lb.	.0875/	.16
Kosmos 70/Dixie 70	lb.	.0925/	.16
Philblack I	lb.	.0925/	.16
Statex 125	lb.	.0875/	.16
Vulcan 6	lb.	.0925/	.16

General-Purpose Furnace—GPF

Arogen GPF	lb.	.055 /	.1275
Continex GPF	lb.	.055 /	.1275
Kosmos 35	lb.	.06 /	.1275
Statex G	lb.	.055 /	.1275
Sterling V	lb.	.06 /	.1275
Non-staining	lb.	.06 /	.1275

High Modulus Furnace—HMF

Continex HMF	lb.	$0.0575/	$0.13
Kosmos 40/Dixie 40	lb.	.0625/	.13
Modulex HMF	lb.	.0625/	.13
Statex 93	lb.	.0575/	.13
Sterling L, LL	lb.	.0625/	.13

Semi-Reinforcing Furnace—SRF

Continex SRF	lb.	.0525/	.125
Essex SRF	lb.	.0525/	.125
Furnex	lb.	.0525/	.125
Gastex	lb.	.0625/	.135
Kosmos 20/Dixie 20	lb.	.0575/	.125
Pelletex, NS	lb.	.0575/	.125
Regal	lb.	.0575/	.125
Sterling NS, S	lb.	.0575/	.125
R	lb.	.0625/	.135

Super Abrasion Furnace—SAF

Aromex SAF	lb.	.1150/	.1825
Kosmos 85	lb.	.115 /	.19
Philblack E	lb.	.115 /	.19
Statex 160	lb.	.11 /	.19
Vulcan 9	lb.	.115 /	.19

Fine Thermal—FT

P-33	lb.	.0575/	.0625
Sterling FT	lb.	.0625	

Medium Thermal—MT

Sterling MT	lb.	.045	
Non-staining	lb.	.055	
Thermax	lb.	.04 /	.045
Stainless	lb.	.05 /	.055

Awaiting Classification

Neotex 100	lb.	.0725/	.145
130	lb.	.0875/	.16
150	lb.	.11 /	.19
Regal 300	lb.	.0775/	.145
600	lb.	.0925/	.16

Colors

Black

Iron oxides, comml.	lb.	.1235/	.135
BK—Lansco	lb.	.1275/	.13
Williams	lb.	.145	
Lansco synthetic	lb.	.10	
Mapico pure synthetic	lb.	.1475/	.15
Lampblack, comml.	lb.	.16 /	.45
Superjet	lb.	.085 /	.12
Permanent Blue	lb.	.80 /	1.05
Stan-Tone	lb.	.45 /	1.20
Vansul masterbatch	lb.	.60 /	.65
Paste	lb.	.14 /	.15

Blue

Alkali Blue G, R	lb.	2.45	
C. P. Iran Blues	lb.	.52 /	.54
Du Pont	lb.	2.55 /	4.75
Filo	lb.	.28	
Heveatex pastes	lb.	.80 /	1.45
Lansco ultramarines	lb.	.25 /	.28
Monsanto Blue 7	lb.	1.55	
11	lb.	3.45	
DPB-283	lb.	1.93	
S-11	lb.	2.05	
Permanent Blue	lb.	.80 /	1.05
Solfast	lb.	.90 /	3.25
Stan-Tone Violet Blue			
D-4000	lb.	3.45	
4001	lb.	3.00	
4002	lb.	.90	
4900	lb.	1.97 /	2.15
Vansul masterbatch	lb.	.90 /	2.70

Brown

Filo	lb.	.13	
Iron oxides, comml.	lb.	.1425/	.145
Lansco synthetic	lb.	.125	
Mapico Brown	lb.	.1575/	.16
Sienna, burnt, comml.	lb.	.0425/	.155
Williams	lb.	.115 /	.1775
Raw, comml.	lb.	.045 /	.1325
Williams	lb.	.08 /	.1725
Umber, burnt, comml.	lb.	.06 /	.07
Williams	lb.	.0725/	.085
Raw, comml.	lb.	.0625/	.07
Williams	lb.	.07 /	.0825
Williams, pure brown	lb.	.155	
Vandyke	lb.	.12	
Mapico Tan	lb.	.2325/	.235
Metallic brown pure synthetic	lb.	.05 /	.06
Vansul masterbatch	lb.	2.10 /	2.20

Green

Chrome	lb.	.42 /	.45
Green	lb.	.80 /	2.40
Oxide	lb.	.3925/	1.10
Cyanamid	lb.	.42 /	.45
Green G	lb.	3.00	
Lincoln Green	lb.	5.30 /	6.60
G-4099 6099	lb.	.4450/	.4525
GH-9869	lb.	1.10 /	1.25
9976	lb.	1.20 /	1.35
Du Pont	lb.	2.05 /	2.80
Filo	lb.	.40	
Heveatex pastes	lb.	.95 /	1.85
Lansco Toner	lb.	1.35	
Monsanto Green 3	lb.	2.75	
14	lb.	1.45	
17	lb.	3.95	
71205	lb.	1.35	
DGP	lb.	2.03	
S-17	lb.	2.25	
Permansa	lb.	$1.55	
Serene	lb.	3.50	
Solfast	lb.	.90 /	3.35
Stan-Tone			
D-5000	lb.	3.95	
5001	lb.	.82	
5400	lb.	1.55	
Vansul masterbatch	lb.	2.00 /	2.60

Orange

Benzidine 12193	lb.	3.30	
Cyanamid Permatons	lb.	1.56	
Dianisidine 10406	lb.	2.85	
Du Pont	lb.	2.25	
Molybdate	lb.	.49	
Monsanto Orange 68187	lb.	2.90	
Stan-Tone			
Light orange 70 PCO3	lb.	2.48 /	2.76
D-7003	lb.	3.97 /	4.17
Orange 70 PCO4	lb.	2.80 /	3.08
D-7004	lb.	4.23 /	4.43
7104	lb.	1.85 /	2.05
Vansul masterbatch	lb.	2.00 /	2.60

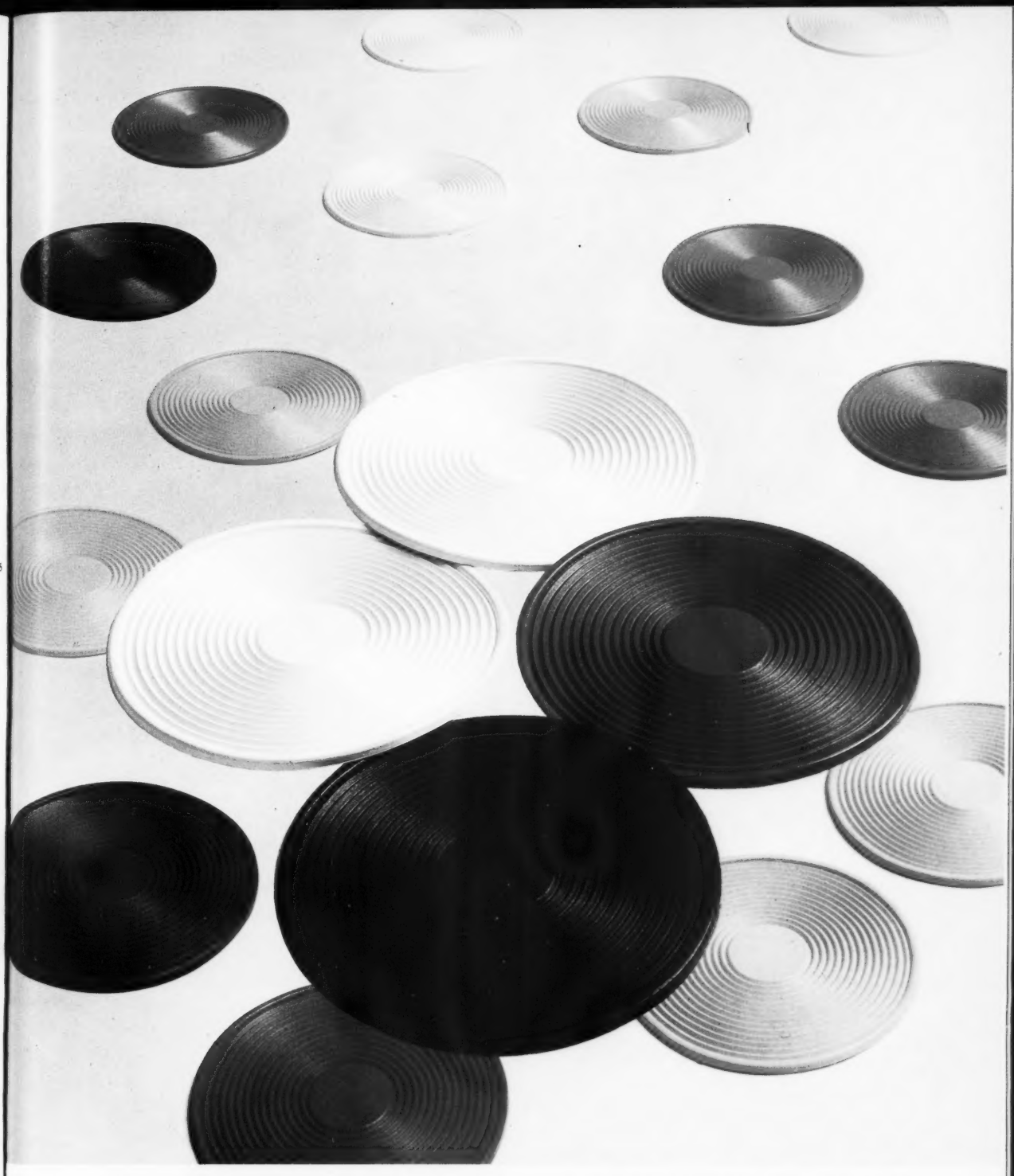
Red

Antimony trisulfide	lb.	.285 /	.315
R. M. P. No. 3	lb.	.72	
Sulfur Free	lb.	.78	
Arcturus CP-1270	lb.	1.40	
Brilliant Toning Red	lb.	.77 /	1.90
Cadmium red lithopones	lb.	2.21 /	3.77
Cadmolith	lb.	1.72 /	2.20
Cyanamid	lb.	.91 /	2.00
Naphthol Red, Scarlet	lb.	2.95 /	3.80
Du Pont	lb.	2.00 /	2.05
Filo	lb.	.11	
Indian Red	lb.	.1275	
Iron oxide, comml.	lb.	.06 /	.13
Lansco synthetic	lb.	.1175	
Mapico pure synthetic	lb.	.1425/	.145
Recco	lb.	.12	
Williams Red	lb.	.13 /	.1525
Lake Red C, CP-1104	lb.	1.25	
Lithol	lb.	.98	1.03
Monsanto Maroon 113	lb.	1.50	
61148	lb.	1.75	
Red 7	lb.	1.55	
41	lb.	4.40	
3501	lb.	1.15	
4004	lb.	1.50	
69191	lb.	3.38	
Autumn	lb.	1.10	
PRP-285	lb.	1.27	
S-44	lb.	1.28	
Plasticone	lb.	1.02 /	4.60
Rub-Er-Red	lb.	.0975	
Solfast	lb.	1.47	1.80
Stan-Tone			
70 PCO5	lb.	3.00 /	3.28
D-2000	lb.	1.30	
2110	lb.	1.03	
2120, 2121	lb.	.98	
2200	lb.	1.52	
2500	lb.	1.90	
2600	lb.	4.60	
2601	lb.	1.60	
2700	lb.	1.75	
2800	lb.	1.90	
Light Red D-7005	lb.	4.68 /	4.88
7105	lb.	1.97 /	2.17
Red 70 PCO6	lb.	3.35 /	3.63
D-7006	lb.	4.89 /	5.09
7106	lb.	2.20 /	2.40
Vansul masterbatch	lb.	.95 /	3.30
Venetian	lb.	.04 /	.0675

White

Antimony oxide	lb.	.27 /	.285
Burgess Iceberg	ton	50.00 /	80.00
Cryptone BT	lb.	.10 /	.11
Permolith lithopone	lb.	.0825/	.0912
Titanium pigments			
Horse Head Anatase	lb.	.255 /	.27
Rutile	lb.	.275 /	.29
Rayox LW	lb.	.195 /	.205
R-110	lb.	.215 /	.225
Ti-Cal	lb.	.075 /	.0825
Ti-Pure	lb.	.195 /	.225
Titanox A, AA, A-168	lb.	.255 /	.265
C-50	lb.	.1438/	.1488
RA, -10, -50	lb.	.275 /	.285
RC	lb.	.0963/	.1013
-HT, -HTX	lb.	.0963/	.0988
Rutile	lb.	.205 /	.29
Unitane	lb.	.255 /	.29
Zopaque Anatase	lb.	.245 /	.27
Zinc oxide, comml.	lb.	.145 /	.1825
Azo ZZZ-11, 44, -55	lb.	.145 /	.155
12% leaded	lb.	.125 /	.135
35% leaded	lb.	.15375/	.16375
50% leaded	lb.	.1575/	.1675
Eagle AAA, lead free	lb.	.145 /	.155
5% leaded	lb.	.145 /	.155
35% leaded	lb.	.15375/	.16375
50% leaded	lb.	.1575/	.1675
Florence Green Seal	lb.	.1625/	.1725
Red Seal	lb.	.1575/	.1675
White Seal	lb.	.1675/	.1775
Horsehead XX-4, -78	lb.	.145 /	.155
Kadox-15, -17, -72, -515	lb.	.145 /	.155
-25	lb.	.15 /	.16
Lehigh, 35% leaded	lb.	.15375/	.16375
50% leaded	lb.	.1575/	.1675

‡ At the request of the suppliers, the lowest prices shown for carbon blacks are for carloads in bags. Prices for hopper carloads are lower.



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Name the processing and product qualities you want in anything from calendered sheeting to complex die extrusions, and Polymer will match your needs from *the world's most versatile range of non-staining nitrile rubbers.* This range is the improved Polysar* Krynac series of five non-staining, oil-resistant copolymers of butadiene and acrylonitrile, and one non-staining butadiene-acrylonitrile-divinylbenyene terpolymer. See the other side of this page for an outline of this Polysar Krynac series. For more complete information, write: Marketing Division, Polymer Corporation Limited, Sarnia, Canada. Ask for Technical Reports Nos. 9:5C; 9:3A; 9:10A; 8:10A; 8:5B.

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Recommended for applications requiring very high oil resistance in easy processing compounds or in normal processing compounds where only low plasticizer loading can be tolerated.

Polysar Krynac is a copolymer of butadiene and acrylonitrile with low raw polymer viscosity. It offers substantial advantages in processing while maintaining vulcanizate properties similar to those of Polysar Krynac 801 NS.

DESCRIPTION

Physical form	bale
Weight of bale (approximate)	75 lb.
Packaging method	talc dusted
Package colour code	white on green
Monomers	butadiene and acrylonitrile
Typical ACN content	38.5%
Polymerization system	low temperature
Stabilizer type	non-staining
Raw polymer viscosity (ML-4 @ 212°F)	47
Specific gravity	0.96

Compound Applications for Polysar Krynac 805

1 Printing plates and printing rolls with low plasticizer content
2 Hose tube stocks with low plasticizer content
3 Roll cover stocks
4 Friction stocks
5 Calendered stocks
6 High hardness stocks
7 Sponge stocks

distributors

H. MUEHLSTEIN & CO., INC.
521 Fifth Avenue, New York 17, N.Y., U.S.A.

Comercial Tropical, S.A.,
Apartado Postal No. 1002,
Mexico 1, D.F.

H. W. Bethencourt, S.A.,
Caixa Postal 1496,
Rio de Janeiro, Brazil.

Rodrap, S.A.,
Casilla Correo 5688,
Buenos Aires, Argentina.

Transmar Limited,
Casilla 1876,
Santiago, Chile.

POLYMER CORPORATION LIMITED
POLYSAR
SARNIA CANADA
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DISTRIBUTORS IN 43 COUNTRIES AROUND THE WORLD

Zinc Oxide (*Cont'd*)			
Protox-166, -167	lb.	$0.145 /	$0.155
St. Joe, lead free	lb.	.145 /	.175
Zinc sulfide, comml	lb.	.253 /	.263
Cryptone ZS	lb.	.253 /	.263
Yellow			
Benzidine 12199	lb.	.58 /	2.55
Cadmium yellow lithopones	lb.	1.12 /	1.15
Cadmolith	lb.	1.12 /	1.20
Chrome	lb.	.35 /	.145
Cyanamid Hansa Yellow	lb.	2.20	
Du Pont	lb.	2.25	
Filo	lb.	.10	
Iron oxide, comml	lb.	.0525 /	.1175
Lansco synthetic	lb.	.1075	
Mapico pure synthetic	lb.	.12 /	.1275
Williams	lb.	.115 /	.1225
Lightfast Benzidine 12220	lb.	3.40	
Monsanto Yellow 14	lb.	1.91	
10010	lb.	1.91	
BYP-282	lb.	1.21	
GA	lb.	2.45	
S-10010	lb.	1.17	
Stan-Tone			
D-1100	lb.	2.55	
1101	lb.	.69	
Lemon 70 PCO1	lb.	1.77 /	2.19
D-7001	lb.	2.80 /	3.00
Medium yellow 70 PCO2	lb.	1.79 /	2.21
D-7002	lb.	2.98 /	3.18
Vansul masterbatch	lb.	.95 /	1.95
Williams Ocher	lb.	.0575/	.06
Dusting Agents			
Antidust	lb.	.37 /	.41
Diatomaceous silica	ton	32.00 /	48.00
Extrud-o-Lube, conc	gal.	1.33 /	1.69
Glycerized Liquid Lubricant, concentrated	gal.	1.25 /	1.63
Glyso-Lube, #3	lb.	.14	
Latex-Lube GR	lb.	.20	
Pigmented	lb.	.1825	
R-66	lb.	.165	
Liqui-Lube	lb.	.1625	
N. T.	lb.	.1675	
Liquizinc No. 305	lb.	.30 /	.35
Lubrex	lb.	.25 /	.30
Mica 160 Biotite	lb.	.065 /	.0725
Mesh	lb.	.08 /	.0875
325 Mesh	lb.	.0825/	.09
Concord	lb.	.08 /	.09
Mineralite	ton	45.00	
Pigmented Separex, LG	lb.	.105	
Slab-Dip, S-20	lb.	.11 /	.15
Pyrax A	ton	14.50 /	15.00
W. A	ton	17.00 /	17.50
Rexanol	lb.	.13	
Talc, comml	ton	18.40 /	38.50
EM	ton	11.00 /	63.00
LS Silver	ton	29.25	
Nytals	ton	28.00 /	38.00
Sierra Sagger 7	ton	34.00	
White IR	ton	19.75	
III	ton	20.75	
Vanfre	gal.	1.95 /	3.00
Wet-Zinc, CW, P	lb.	.20 /	.2225
Extenders			
BRS 700	lb.	.02 /	.036
BRT 7	lb.	.035 /	.036
Cumar Resins	lb.	.095 /	.19
Dielex B	lb.	.06	
Factice, Amberex	lb.	.29 /	.36
Brown	lb.	.1425/	.263
Neophax	lb.	.157 /	.268
White	lb.	.144 /	.285
G. B. Asphaltenes	lb.	.097 /	.177
Millex, W	lb.	.07	
Mineral Rubbers			
Black Diamond	ton	38.00 /	40.00
Hard Hydrocarbon	ton	53.00 /	60.00
Hydrocarbon MR	ton	45.00 /	55.00
Parmr	ton	21.00 /	29.00
T-MR Granulated	ton	47.50 /	50.00
Nuba No. 1, 2	lb.	.0575/	.0625
3X	lb.	.0775/	.0825
OPD-101	lb.	.26	
Rubber substitute, brown	lb.	.16 /	.2572
Car-Bel-Ex A	lb.	.14	
Car-Bel-Lite	lb.	.35	
Extender 600	lb.	.1765	
White	lb.	.192 /	.2103
Stan-Shells	ton	35.00 /	73.00
Sublac Resin PX-5	lb.	.215 /	.235
Sundex 53	gal.	.12	
85	gal.	.1725	
Synthetic 100	lb.	.41	
Vistanex L grades	lb.	.35	
Fillers, Inert			
Agrashell flour	ton	50.00 /	74.00
Albacar	ton	55.00 /	75.00
Barytes, floated, white	ton	49.00 /	70.85
No. 1	ton	55.00 /	77.50
2	ton	50.00 /	72.50
Off-color, domestic	ton	25.00	
Sparmite	ton	95.00 /	117.00
Blanc fixe	ton	100.00 /	165.00
Burgess HC-75	ton	12.00 /	30.00
80	ton	14.00 /	32.00
Iceberg	ton	53.00	
Pigment #20	ton	30.00	
#30	ton	40.00	
WP #1	ton	11.00 /	16.00

Note

Suppliers are requested to submit product additions or deletions and price changes promptly as they occur in order that we may make the listing of maximum service to our readers. Comments on the present listing and classifications are invited with a view toward facilitating location of specific items.

Correspondence should be directed to Market Editor, RUBBER WORLD, 630 Third Avenue, New York 17, New York.

Camel-Carb	ton	$14.00	
-Tex	ton	22.00	
-Wite	ton	35.00	
Cary #200	ton	30.00 /	$55.00
CCC #1	ton	10.50 /	12.50
"G"	ton	15.00 /	17.00
Citrus seed meal	lb.	.04	
Oil	lb.	.15	
Diatomaceous silica	ton	32.00 /	48.00
Flocks			
Cotton, dark	lb.	.095 /	.135
Dyed	lb.	.55 /	.60
White	lb.	.13 /	.33
Fabrifil X-24-G	lb.	.135	
X-24-W	lb.	.235	
Filfloc 6000	lb.	.33	
F-40-900	lb.	.135	
HSC #35 Silicone Emulsion	lb.	1.22 /	2.46
Hydrite	ton	25.00 /	50.00
Kalite	ton	52.50 /	67.50
Lithopone, comml	lb.	.075 /	.085
Eagle	lb.	.0725/	.075
Permolith	lb.	.08 /	.0875
Sunolith	lb.	.075 /	.0825
Mica, 160 Biotite	lb.	.065 /	.0725
Mesh	lb.	.08 /	.0875
160 Mesh, 325 Mesh	lb.	.075 /	.09
Concord	lb.	.08 /	.09
Millical	ton	38.00 /	53.00
Mineralite	ton	40.00 /	60.00
Non-Fer-Al	ton	35.00 /	50.00
Ohio Superspray lime	ton	16.50	
Pulverized limestone, Stonelite	ton	8.25 /	11.00
Purecal M,O	ton	58.50 /	85.00
Pyrax A	ton	14.50 /	15.00
W. A	ton	17.00 /	17.50
Sawdust	ton	14.00 /	35.00
Silversheen Mica	lb.	.08 /	.09
Stan White	ton	10.50 /	13.10
Super-White Silica	ton	25.00 /	46.50
Surfex	ton	37.50 /	52.50
MM	ton	42.00 /	57.00
Suspenso	ton	38.00 /	53.00
Ti-Cal	lb.	.0675	
Walnut shell flours	ton	50.00 /	84.00
Whiting, limestone			
Atomite	ton	32.50 /	35.00
Calcite	ton	23.00	
Calwhite	ton	20.00 /	27.00
-T	ton	23.00	
Duramite	ton	20.00	
Gamaco	ton	32.50 /	40.00
Keystone	ton	20.00 /	22.00
Laminar	ton	30.00	
No. 10 White	ton	11.00 /	16.50
Omya	ton	30.00	
BSH	ton	45.00	
Paxinosa	ton	14.50 /	22.50
Snowflake	ton	17.00 /	18.00
Witco	ton	13.00	
York	ton	9.50	
Finishes			
Apex Bright Finish #5200-E	lb.	.25	
Rubber Finish	gal.	2.50	
Black-out	gal.	4.50 /	8.00
Flocks, Rayon, colored	lb.	.90 /	1.50
White	lb.	.75 /	1.25
Also see Flocks, under Fillers, Inert			
Paraflint RG and RGU Synthetic Wax	lb.	.15 /	.22
Rubber lacquer, clear	gal.	1.00 /	2.00
Shellacs, Angelo	lb.	.485 /	.7325
Vac Dry	lb.	.485 /	.57
Talc (*See Talc, under Dusting Agents*)			
Unidip	lb.	.15 /	.20
Wax, Bees	lb.	.67 /	.83
Carnauba	lb.	.57 /	1.13
Monten	lb.	.27	
Neutral	gal.	.76 /	1.31
No. 118, colors	gal.	.86 /	1.41
Van Wax	gal.	2.00 /	2.05
Latex Compounding Ingredients			
Acintol D, DLR	lb.	.0625/	.085
FA #1	lb.	.0675/	.09
#2	lb.	.0825/	.105

Accelerator 552	lb.	$2.25	
Accelerator J-117, -302	lb.	1.00 /	$1.13
-144	lb.	.15 /	.30
-307	lb.	1.10 /	1.25
-311	lb.	.60 /	.75
Aerosol, dry types	lb.	.65 /	.80
Liquid types	lb.	.40 /	.75
Alcogard 354	lb.	1.40 /	1.42
Alcogum AK-12	lb.	.12 /	.14
AN-6	lb.	.055 /	.06
-10	lb.	.09 /	.10
-25	lb.	.31	
PA-15	lb.	.16	
Alrosol	lb.	.41	
Amberex solutions	lb.	.1675/	.18
Antifoam J-114	lb.	3.25 /	3.45
P-242	lb.	.24 /	.35
Antioxidant J-137, -140	lb.	.55 /	.70
-139, -293	lb.	1.45 /	1.60
-182	lb.	2.00 /	2.15
-186	lb.	1.40 /	1.55
2246	lb.	1.50 /	1.53
Anti Webbing Agent J-183	lb.	.75 /	.90
-297	lb.	.27 /	.40
Aquablak B	lb.	.1075/	.1175
G	lb.	.13 /	.14
K	lb.	.13 /	.14
M	lb.	.12 /	.13
Aquarex D	lb.	.81	
G	lb.	.24	
L	lb.	.94	
MDL	lb.	.33	
ME	lb.	.82	
Aquarex NS	lb.	.60	
SMO	lb.	.50	
WAQ	lb.	.21	
Ben-A-Gels	lb.	.98 /	1.40
Bentone 18, 18C	lb.	.45	
34	lb.	.60	
Casein	lb.	.22	
Cellosize WP-09, -3, -40, -300	lb.	1.00 /	1.17
CW-12	lb.	.85	
-37	lb.	.70	
DC Antifoam A Compound	lb.	5.45 /	6.65
B	lb.	.63 /	1.10
Emulsion	lb.	2.05 /	4.00
AF Emulsion	lb.	2.05 /	2.85
Compound 7	lb.	5.13 /	6.50
Defoama W-1701	lb.	.125	
Defoamer 115a	lb.	.50	
NDW	lb.	.215 /	.235
Dispersing Agents			
Blancol	lb.	.1525/	.26
N	lb.	.155 /	.26
Darvan Nos. 1, 2, 3	lb.	.22 /	.30
Daxad 11, 21, 23, 27	lb.	.08 /	.30
Dispersaid H7A	lb.	.58	
1159	lb.	.43	
Emulphor ON-870	lb.	.50 /	.70
Igepal CO-630	lb.	.2875/	.47
Igepon T-73	lb.	.285 /	.495
T-77	lb.	.45 /	.69
Indulins	lb.	.06 /	.08
Kreelons	lb.	.132 /	.155
Laurelton Oil	lb.	.18	
Leonil SA	lb.	.52 /	.65
Lomar PW	lb.	.18	
Marasperse CB	lb.	.1225/	.1425
N	lb.	.095 /	.105
Modicols	lb.	.17 /	.58
Nekal BA-75	lb.	.395 /	.54
BX-76	lb.	.63 /	.75
Nopco 1287	lb.	.155 /	.195
Orzan A	lb.	.0325	
S	lb.	.0425	
Pluronics	lb.	.335 /	.40
Polyfons	lb.	.08 /	.09
Sorapon SF-78	lb.	.28 /	.40
Tergitol 7	lb.	.4125/	.44
NPX	lb.	.275 /	.3074
TMN	lb.	.2875/	.32
Trenmine W-30	lb.	.15	
W-40	lb.	.60 /	.75
Triton R-100	lb.	.12 /	.25
X-100, -102, -114	lb.	.255 /	.36
Dispersions			
Agebest 1293-22	lb.	1.90 /	2.00
AgeRite Alba	lb.	3.00	
Powder, Resin D	lb.	.80	
White	lb.	1.80	
Altax	lb.	.75	
Shield No. 2, 6	lb.	.08	
3	lb.	.095	
4-35	lb.	.09	
5	lb.	.093	
7-F, 8	lb.	.165	
55	lb.	.18	
Iron Oxide, 60%	lb.	.40	
L.S.W.	lb.	1.50	
No. 305 Liquizinc	lb.	.30 /	.35
P-33	lb.	.35	
Rotax	lb.	.75	
Sulfur	lb.	.13 /	.15
Telloy	lb.	3.62	
Tuads, Methyl	lb.	1.60	
Vulcacure NB	lb.	.45	
NS	lb.	.75 /	1.05
T.M.D.	lb.	1.14	
ZB, ZE, ZM	lb.	.85 /	.89
Vulcanizing, C group	lb.	.40 /	1.30
G group	lb.	.45 /	.90
N group	lb.	.40 /	1.00
Zetax	lb.	.75	
Zimates, Butyl	lb.	1.30	
Ethyl, Methyl	lb.	1.35	
Zinc oxide	lb.	.40	
Emulsions			
AgeRite Spar	lb.	1.00	

Emulsions (Cont'd)

AgeRite Stalite	lb.	$0.75
Superlite	lb.	1.00
Borden Arco A-25, A-26 7.16-30	lb.	.18 / $0.19
555-40R	lb.	.185 / .2025
620-32B	lb.	.20 / .21
716-35	lb.	.17 / .18
1041-21	lb.	.165 / .175
Habuco Resin Nos. 502, 515, 523	lb.	.195 / .20
503	lb.	.22 / .225
504, 526	lb.	.19 / .195
517	lb.	.175 / .18
524	lb.	.155 / .16
Resin A-2	lb.	.16 / .25
P-370	lb.	.175 / .25
X-210	lb.	.12 / .22
Freeze-Stabilizer 322	lb.	.40
12116C	lb.	.52
Hyonic PE 250	lb.	.255 / .295
Igepon T-43	lb.	.145 / .35
T-51	lb.	.125 / .285
-73	lb.	.285 / .495
Ludox	lb.	.1675/ .195
Marmix	lb.	.41 / .48
Merac	lb.	.75 / 1.05
Micronex, colloidal	lb.	.06 / .072
Modical S	lb.	.3084/ .3284
VD	lb.	.1384/ .1584
Monsanto Blue 4685 WD	lb.	1.60
Green 4884 WD	lb.	1.80
Red 127	lb.	1.25
OPD 101	lb.	.16 / .26
Picco Latex Plasticizer A-12	lb.	.069 / .096
Pliolite Latex 150, 190	lb.	.32 / .41
170	lb.	.37 / .46
Polyvinyl methyl ether	lb.	.25 / .45
Resin V	lb.	.13
Roelgel 100C	lb.	.46
Santomerse #3 Paste	lb.	.26 / .30
Sellogen Gel	lb.	.1275
Sequestrene AA	lb.	.905 / .975
ST	lb.	.585 / .615
30A	lb.	.245 / .265
Setsit #5	lb.	.75 / 1.05
#9	lb.	.85 / 1.15
Stablex A	lb.	.80 / 1.10
B, G	lb.	.50 / .95
K	lb.	.27 / .35
P	lb.	.35 / .50
T	lb.	.14 / .22
Surfactol 13	lb.	.345 / .36
Vult-Accel E	lb.	.85 / .92
Webnix	lb.	1.50 / 2.50

Mold Lubricants

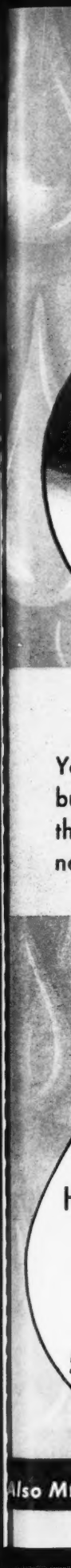
A-C Polyethylene	lb.	.275 / .52
Acintol D	lb.	.0625/ .085
Alipal CO-433	lb.	.25 / .45
CO-436	lb.	.22 / .41
Aquarex Compounds	lb.	.21 / .94
Carbowax 200, 300, 400	lb.	.22 / .25
1500	lb.	.225 / .2825
4000	lb.	.31 / .32
6000	lb.	.35 / .36
Castorwax	lb.	.3375/ .3575
Colite Concentrate	gal.	.90 / 1.15
D-Tak Dip #10	gal.	1.50
DC Mold Release Fluid	lb.	3.14 / 4.75
200 Fluid	lb.	3.14 / 4.75
Compound 4, 7	lb.	5.13 / 6.50
Emulsion 7	lb.	1.20 / 1.74
8, 35, 35A, 35B, 36	lb.	1.20 / 1.74
ELA	lb.	.82
FT Wax 200	lb.	.265 / .42
300	lb.	.295 / .45
Glycerized Liquid Lubricant, concentrated	gal.	1.25 / 1.63
Igepals	lb.	.2875/ .74
Igepon AP-78	lb.	.44 / .68
T-43	lb.	.145 / .35
-51	lb.	.125 / .285
-73	lb.	.285 / .495
L-45 Silicone Oil	lb.	2.90 / 4.61
LE-45 Silicone Oil Emulsion	lb.	1.15 / 1.69
-450 Silicone Emulsion	lb.	1.15 / 1.69
L-520 Organo-Silicone Fluid	lb.	2.46 / 3.50
-522 Organo-Silicone Fluid	lb.	2.68 / 3.50
Lubrex	lb.	.27 / .32
Lubri-Flo	gal.	10.00 / 12.05
Lustermold	lb.	.41
Mold Lubricant No. 426	lb.	.18
Paste	lb.	.25
Monopole Oil	lb.	.16
Monten Wax	lb.	.57
MR-22	gal.	9.95 / 14.95
Para Lube	lb.	0.46 / .048
Paraflint RG and RGU Synthetic Wax	lb.	.15 / .22
Plaskon 8406, 8407	lb.	.30 / .37
8416, 8417	lb.	.35 / .42
8429	lb.	.40 / .47
Pluronics	lb.	.335 / .44
Poly-Brite PE-20	lb.	.28 / .42
600	lb.	.42 / .58
Poly-Cone 125X	lb.	1.20 / 1.40
1000	lb.	.93 / 1.06
Polyglycol E series	lb.	.29 / .42
RA-1 -2, -3	gal.	2.25 / 3.00
Rubber Glo	gal.	.94 / .97
Silrex S-1	lb.	.65
SM-33, -55, -61, -62	lb.	1.22 / 1.76
Soap, Hawkeye	lb.	1.25 / 1.45
Purity	lb.	.155 / .165
Sodium stearate	lb.	.40
Stoner's 700 series	gal.	1.20 / 1.25
Stoner's 800 series	gal.	$1.26 / $1.70
900 series	gal.	1.55 / 2.00
A series	gal.	1.80 / 4.50
Ucon 50-HB Series	lb.	.25 / .375
Ulco	lb.	.12 / .23
Vanfre	gal.	1.95 / 3.00
XLE-420 Silicone Oil Emulsion	lb.	1.18 / 1.70

Odorants

Alamasks	lb.	.75 / 6.50
Coumarin	lb.	2.95 / 3.55
Ethavan	lb.	6.75 / 7.35
Latex Perfume #7	lb.	4.00
Neutroleum Gamma	lb.	3.60
Rodo	lb.	4.00 / 5.50
Rubber Perfume #10	lb.	2.60
Vanillin, Monsanto	lb.	3.00 / 3.15

Plasticizers and Softeners

Acintol DLR	lb.	.0625/ .085
Adipol 2EH, 10A, XX	lb.	.40 / .44
RC	lb.	.45 / .475
ODY	lb.	.40 / .44
Admex 710	lb.	.3325/ .3625
711	lb.	.3325/ .3825
744	lb.	.3925/ .3825
Arc Lene #1080	lb.	.10 / .12
Baker AA Oil	lb.	.23
Crystal O Oil	lb.	.21 / .255
Processed oils	lb.	.215 / .235
Bardol 639	lb.	.0275/ .0375
B	lb.	.055 / .065
Benzoflex 2-45	lb.	.26 / .29
9-88	lb.	.27 / .30
Bondogen	lb.	.555 / .605
BRC-20	lb.	.022 / .0245
22	lb.	.026 / .0285
30	lb.	.0165/ 025
521	lb.	.023
BRH 2	lb.	.0341/ .0351
BRS 700	lb.	.036
BRT 7	lb.	.035 / .036
BRV	lb.	.0625/ .065
Bunarex Liquid	lb.	.0875/ .0925
Resins	lb.	.085 / .095
Bunatak AH	lb.	.085 / .095
N	lb.	.31
U	lb.	.175
83	lb.	.0685
90	lb.	.09
210	lb.	.14
Bunnatol G, S	lb.	.40 / .505
Butac	lb.	.1735/ .1835
Butyl oleate	lb.	.23 / .27
Butyl stearate, comml.	lb.	.255
R-17	lb.	.22 / .26
Binney & Smith	lb.	.23 / .26
FMC	lb.	.2725/ .2825
Harchem	lb.	.2525/ .3425
Kessoflex	lb.	.245 / .275
Butyl stearate—G.P.	lb.	.0125/ .02
R-100	lb.	.045 / .0525
TT	lb.	.017 / .02
Califlux 510, 550	lb.	.0275/ .0375
G.P.	lb.	.015 / .0225
R-100	lb.	.0475/ .0575
T-T	lb.	.019 / .0295
Capryl alcohol, comml.	lb.	.195 / .30
Columbian Carbon	lb.	.195 / .30
Harchem	lb.	.195 / .30
Chlorowax 40	lb.	.1625/ .1825
70	lb.	.185 / .245
-S	lb.	.21 / .27
Circo light	gal.	.17
Circosol-2XH	gal.	.185
Contogums	lb.	.0875/ .111
Cumar Resins	lb.	.065 / .17
DBM (dibutyl-m-cresol) Durar	lb.	.32 / .3475
DBP (dibutyl phthalate), comml.	lb.	.26 / .40
Darex	lb.	.30 / .33
Eastman	lb.	.285 / .29
Harflex 140	lb.	.275 / .315
Harwick Std. Chem. Co.	lb.	.325 / .385
Hatco	lb.	.30 / .33
Monsanto	lb.	.285 / .325
Naugatuck	lb.	.30 / .33
PX-104	lb.	.26 / .30
Rubber Corp. of America	lb.	.285 / .44
Sherwin-Williams	lb.	.30 / .33
DBS (dibutylsebacate) comml.	lb.	.66 / .69
Eastman	lb.	.655 / .685
Harflex 40	lb.	.655 / .685
Hatco	lb.	.66 / .685
Monoplex	lb.	.66 / .675
Naugatuck	lb.	.665 / .69
PX-404	lb.	.665 / .685
DCP (dicaprylphthalate), comml.	lb.	.295 / .325
Harflex 180	lb.	.26 / .30
Hatco	lb.	.295 / .325
Monoplex	lb.	.30 / .315
DDA (didecyladipate) Good-rite GP-236	lb.	.40 / .59
Kessoflex	lb.	.40 / .435
DDP (didecylphthalate) Good-rite GP-266	lb.	.295 / .45
Hatco	lb.	.305 / .435
Defoamer X-3	lb.	.355
DIBA (diisobutyladipate) Darex	lb.	.4325/ .4625
Eastman	lb.	.40 / .44
Ohio-Apex	lb.	.41 / .45
DIDA (diisodecyladipate) Monsanto	lb	$0.40 / $0.44
RC	lb.	.40 / .44
DIDP (diisodecylphthalate) Darex	lb.	.32 / .35
Harflex 110	lb.	.265 / .305
Monsanto	lb.	.26 / .30
Ohio-Apex	lb.	.27 / .31
PX-120	lb.	.26 / .30
RC	lb.	.27 / .31
Dielex B	lb.	.06
Diethylene glycol, comml.	lb.	.1525/ .1825
Wyandotte	lb.	.15 / .165
Di-2 ethylhexyl azelate	lb.	455 / 495
Dinopol IDO	lb.	.27 / .31
MOP	lb.	.28 / .32
DIOA (diisooctyladipate) Kessoflex	lb.	.40 / .435
Naugatuck	lb.	.435 / .465
PX-208	lb.	.40 / .435
Rubber Corp. of America	lb.	.40 / .44
DIOP (diisooctylphthalate), comml.	lb.	.305 / .335
Darex	lb.	.32 / .35
Eastman	lb.	.25 / .29
Harflex 120	lb.	.26 / .30
Hatco	lb.	.305 / .335
Monsanto	lb.	.26 / .30
Naugatuck	lb.	.305 / .335
Ohio-Apex	lb.	.265 / .305
PX-108	lb.	.26 / .30
Rubber Corp., of America	lb.	.265 / .305
Sherwin-Williams	lb.	.32 / .34
DIOS (diisooctylsebacate), comml.	lb.	.61 / .64
Rubber Corp. of America	lb.	.5925/ .6325
DIOZ (diisooctylazelate) Cabflex	lb.	.48 / .51
Dipolymer Oil	gal.	.33 / .48
Dispersing Oil No. 10	lb.	.06 / .0625
DNODA (di-n-octyl-n-decyl adipate), Monsanto	lb.	.40 / .44
DOA (dioctyladipate), comml.	lb.	.425 / .455
Eastman	lb.	.40 / .44
Good-rite GP-233	lb.	.40 / .55
Harflex 250	lb.	.40 / .435
Hatco	lb.	.435 / .465
Monsanto	lb.	.40 / .44
Naugatuck	lb.	.435 / .465
PX-238	lb.	.40 / .435
Rubber Corp. of America	lb.	.40 / .44
DOP (dioctylphthalate), comml.	lb.	.305 / .335
Darex	lb.	.32 / .35
Eastman	lb.	.265 / .30
Good-rite GP-261	lb.	.285 / .44
Harflex 150	lb.	.26 / .30
Hatco	lb.	.305 / .335
Monsanto	lb.	.26 / .30
Naugatuck	lb.	.305 / .335
Ohio-Apex	lb.	.25 / .29
Polycizer 162	lb.	.28 / .435
PX-138	lb.	.25 / .29
Rubber Corp. of America	lb.	.265 / .305
Sherwin-Williams	lb.	.305 / .335
DOS (dioctylsebacate) comml.	lb.	.61 / .64
Eastman	lb.	.61 / .64
Harflex 50	lb.	.5925/ .6225
Hatco	lb.	.61 / .635
Monoplex	lb.	.61 / .635
Naugatuck	lb.	.615 / .64
PX-438	lb.	.5925/ .6225
Rubber Corp. of America	lb.	.5925/ .6325
Drapex 3.2	lb.	.40 / .54
Dutch Boy NL-A10 (DBP)	lb.	.30 / .33
-A20 (DOP), A30 (DIOP)	lb.	.305 / .335
-A54	lb.	.295 / .325
-C20 (DOS)	lb.	.61 / .63
-F21	lb.	.395 / .425
-F31	lb.	.44 / .47
-F41	lb.	.48 / .51
Dutrex 6	lb.	.025 / .035
Dymerex Resin	lb.	.135 / .1475
Elastex 36-R	lb.	.43 / .4625
37-R	lb.	.70 / .71
Emulphor EL-719	lb.	.52 / .73
Endor	lb.	.67
Ethox	lb.	.43 / .455
Ethylene glycol, comml.	lb.	.135 / .165
Wyandotte	lb.	.1325/ .1425
Flexol 3 GH	lb.	.44 / .46
3 GO	lb.	.53 / .55
4 GO	lb.	.325 / .355
10-A	lb.	.425 / .455
426	lb.	.27 / .30
810, 810X, 10-10, 10-10X	lb.	.305 / .335
TPE. A-26	lb.	.435 / .465
Flexricin P-4	lb.	.3325
P-6	lb	.40
P-8	lb.	.3325
PG-16	lb.	.335 / .35
Fortex	lb.	.125 / .145
Fura-Tone NC 1008	lb.	.28
1012	lb.	.46
G. B. Asphaltic Flux	gal.	.097 / .177
Naphthenic Neutrals	gal.	.125 / .215
Process oil, light	lb.	.0275/ .0375
Medium	lb.	.0375/ .0475
Galex W-100	lb.	.155 / .18
W-100 D	lb.	.1525/ .1775
Gilsowax B	lb.	.0975/ .11
Harchemex	lb.	.24 / .285
Harflex 300	lb.	.58 / .615
325	lb.	.4325/ .46
375	lb.	.7425/ .83
500	lb.	.315 / .41



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(LIQUID CONCENTRATE)
LUBRICANT

PREVENTS STICKING

A microscopic film of
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(LIQUID CONCENTRATE)
You won't be able to see it on the rubber but you will know of its presence because of the non-adhesive properties it imparts. Does not interfere with tack or knit of stock.
ASK FOR SAMPLE

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1 DRUM MAKES UP TO 50 DRUMS OF WORKING SOLUTION

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HB-20	lb.	$0.15 /	$0.185
-40	lb.	.19 /	.23
Heavy Resin Oil	lb.	.0225/	.0375
HSC-13	lb.	.25 /	.32
-39	lb.	.22 /	.29
Hycar 1312	lb.	.60	
Hypalon Peptizer H-20	lb.	1.59	
Kapsol	lb.	.33 /	.355
Kenflex A, L	lb.	.26 /	.27
B	lb.	.23 /	.24
N	lb.	.18 /	.19
Kessoflex 103	lb.	.405	
105	lb.	.3325	
106	lb.	.38	
107	lb.	.525	
110	lb.	.24	
111	lb.	.28	
KP-20	lb.	.26 /	.30
-23	lb.	.325 /	.335
-90	lb.	.40 /	.44
-140	lb.	.46 /	.485
-201	lb.	.465 /	.48
-260	lb.	.34 /	.38
Kronisol	lb.	.355 /	.39
Kronitex AA, I, K-3, MX	lb.	.325 /	.36
LX-685, -125, -135	lb.	.125 /	.135
Marvinol plasticizers	lb.	.28 /	.8825
Methox	lb.	.395 /	.43
Millrex	lb.	.15	
Monoplex S-38	lb.	.215 /	.24
S-71	lb	.45 /	.475
Morflex	lb.	.25 /	.65
Natac	lb.	.1685/	.1785
Neoprene Peptizer P-12	lb.	1.18	
W-9	lb.	2.28	
Nevillac	lb.	.31 /	.85
Neville R Resins	lb.	.145 /	.205
Nevinol	lb.	.24	
No. 1-D heavy oil	lb.	.065	
NP-10	lb.	.44 /	.48
ODA (octyldecyladipate)			
Good-rite GP-235	lb.	.40 /	.55
Kessoflex	lb.	.40 /	.435
RC	lb.	40 /	.44
ODP (octyldecylphthalate)			
Good-rite GP-265	lb.	.29 /	.445
Hatco	lb.	.305 /	.335
Rubber Corp. of America	lb.	.27 /	.31
Ohopex Q-10	lb.	.28 /	.32
R-9	lb.	.3525/	.3775
Orthonitro benzophenol, comml.	lb.	.13 /	.15
Palmalene	lb.	.15	
Panaflex BN-1	lb.	.185 /	.225
Panarez Resins	lb.	.09 /	.14
Para Flux, regular	gal.	.10 /	.2125
No. 2016	gal.	.165 /	.24
2332	gal.	.11	
4205	lb.	.1075/	.2125
Para Lube	lb.	.46 /	.48
Resins	lb.	.04 /	.045
Paradene Resins	lb.	.07 /	.08
Paraplex 5-B	lb.	.29 /	.3475
Al-111	lb.	.32 /	.3275
G-25	lb.	.76 /	.77
-40	lb.	.4825/	.51
-50	lb.	.39 /	.4175
-53	lb.	.4325/	.46
-60	lb.	.325 /	.35
-62	lb.	.345 /	.37
RG-7	lb.	.33 /	.335
-8	lb.	.505 /	.5125
-10	lb.	.52 /	.5275
Pepton 22	lb.	.83 /	.86
65	lb.	1.23 /	1.26
65-B	lb.	.83 /	.86
Philrich 5	gal.	.125	
Picco Resins	lb.	.09 /	.17
480 Oilproof Series	lb.	.18 /	.23
Aromatic Plasticizers	lb.	.075 /	.095
Liquid Resin D-165 (Y)	lb.	.06 /	.075
(Z-3)	lb.	.07 /	.085
(Z-6)	lb.	.08 /	.095
S. O. S	gal.	.29 /	.34
Piccocizers	lb.	.05 /	.07
Piccolastic Resins	lb.	.21 /	.27
Piccolyte Resins	lb.	.205 /	.245
Piccopale Resins	lb.	.12 /	.135
Piccovars	lb.	.165 /	.20
Piccovol	lb.	.025 /	.038
Pictar	gal.	.25 /	.40
Pigmentar	lb.	.046 /	.0634
Pigmentaroil	lb.	.046 /	.0634
Pitch, Burgundy, Sunny South	lb.	.103 /	.1085
Pitt-Consol 500	lb.	.23 /	.255
640	lb.	.42	
Plasticizers			
42	lb.	.34 /	.40
84	lb.	.26	
B	lb.	.35 /	.45
DP-520	lb.	.435 /	.455
MP	lb.	.035 /	.0755
MT-511	lb.	.6925/	.7425
ODN	lb.	.35 /	.475
SC	lb.	.38 /	.55
Plastoflex #3	lb.	.52 /	.57
#520	lb.	.36 /	.435
DBE	lb.	.50 /	.55
MGB	lb.	.29 /	.37
SP-2	lb.	.43 /	.48
VS	lb.	.3575/	.3975
Plastogen	lb.	.0875/	.09
Plastone	lb.	.25 /	.32
Polycin 470	lb.	.325 /	.34
Polycizers	lb.	.25 /	.415
162	lb.	.25 /	.405
Polymel-C	lb.	.1775/	.1875
C-130, DX	lb.	.1375/	.1475
D	lb.	.225 /	.235
D-TAC	lb.	.1975/	.215
Poly-Sperse AP-2	lb.	$0.23 /	$0.295
AP-300	lb.	.26 /	.325
LC-20	lb.	.26 /	.325
R-100	lb.	.17 /	.235
PT Pine Tars	lb.	.044 /	.063
101 Pine Tar Oil	lb.	.044 /	.063
RC Plasticizer PR	lb.	.28 /	.43
Reogen	lb.	.1425/	.145
Resin C pitch	lb.	.0225/	.031
R6-3	lb.	.38 /	.40
Resinex 10, 25, 50, 110	lb.	.04 /	.045
70	lb.	.0325/	.0375
85, 100	lb.	.035 /	.04
115	lb.	.0375/	.0425
L-2, L-3, L-4, L-5	lb.	.0225/	.03
Rosin Oil, Sunny South	gal.	.58 /	.76
RPA No. 2	lb.	.85	
3	lb.	.51	
Conc.	lb.	.85	
6	lb.	1.66	
RSN Flux	gal.	.10 /	.91
Rubber Oil B-5	lb.	.0225/	.0355
Rubberol	lb.	.18 /	.2725
Santicizer 1-H	lb.	.50 /	.52
8	lb.	.43 /	.47
9	lb.	.42 /	.44
140	lb.	.325 /	.36
141	lb.	.34 /	.375
160	lb.	.265 /	.305
409	lb.	.39 /	.42
603	lb.	.26 /	.30
B-16	lb.	.465 /	.485
E-15	lb.	.53 /	.56
Santicizer	lb.	.4275/	.4575
Sebacic acid, purified, com.	lb.	.59 /	.65
Binney & Smith	lb.	.64 /	.76
C. P.-Binney & Smith	lb.	.72 /	.84
Harchem	lb.	.655 /	.815
Sherolatum Petroleum	lb.	.05 /	.10
Softener #20	gal.	.10 /	.20
Special Rubber Resin 100	lb.	.1675/	.2175
Staflex AX	lb.	.43	
DBES	lb.	.61 /	.635
Syn-Tac	gal.	.33 /	.635
Synthol	lb.	.17 /	.2625
Tetraflex R-122	lb.	.255 /	.29
Thiokol TP-90B	lb.	.59	
-95	lb.	.65	
Triacetin	lb.	.37 /	.41
Tributyl phosphate	lb.	.50 /	.535
Tributyrin	lb.	.69	
Tricresyl phosphate, comml.	lb.	.33 /	.36
Monsanto	lb.	.325 /	.36
Naugatuck	lb.	.33 /	.36
PX-917	lb.	.33 /	.36
Triphenyl phosphate, comml.	lb.	.39 /	.40
Monsanto	lb.	.415 /	.435
Turgum S	lb.	.156 /	.166
SB	lb.	.105 /	.115
Turpol NC 1200	lb.	.61 /	.70
Tysonite	lb.	.3025/	.305
United	gal.	.69 /	1.20
X-1 Resinous Oil	lb.	.0225/	.0325

Reclaiming Oils

Bardol, 639	lb.	.0275/	.0375
B	lb.	.055 /	.065
BRH 2	lb.	.0213/	.0351
BRT 3	lb.	.02 /	.031
4	lb.	.02 /	.031
7	lb.	.035 /	.036
BRV	lb.	.0625/	.065
Burco-RA	lb.	.053 /	.0805
BWH-1	lb.	.16 /	.17
Dipolymer Oil	gal.	.33 /	.48
Dispersing Oil No. 10	lb.	.06 /	.0625
G. B. Oils	gal.	.115 /	.275
Heavy Resin Oil	lb.	.0225/	.0375
LX-572	gal.	.27 /	.32
-759	gal.	.1375	
-777, -809, -859	gal.	.23 /	.33
-869	gal.	.33 /	.43
-871	gal.	.34 /	.44
No. 3186	gal.	.28 /	.295
Picco 6535	gal.	.25 /	.30
C-33	gal.	.215 /	.385
-42	gal.	.23 /	.40
D-4	gal.	.27 /	.44
E-5	gal.	.25 /	.35
Q-Oil	gal.	.286 /	.36
Pitt-Consol 500	lb.	.28 /	.305
640	lb.	.42	
PT 101 Pine Tar Oil	lb.	.044 /	.063
Reclaiming Oil #3186	gal.	.28 /	.385
-G	gal.	.25 /	.365
4039-M	gal.	.3275/	.3975
-Y	gal.	.30 /	.37
RR-10	lb.	.37	
S. R. O.	lb.	.015 /	.0225
X-1 Resinous Oil	lb.	.0225/	.0325

Reinforcers, Other Than Carbon Black

Angelo Shellacs	lb.	.485 /	.7325
Borden, Chem. Div.			
Arcco 978-42B	lb.	.18 /	.19
1073-18B	lb.	.135 /	.145
1294-36B	lb.	.115 /	.125
1301-12B	lb.	.15 /	.16
BRC-20	lb.	.0235/	.0245
22	lb.	.026 /	.0285
30	lb.	.0165/	.025
521	lb.	.023	
Bunarex Resins	lb.	.085 /	.095
Cab-o-sil	lb.	.66 /	1.45
Calcene CO	ton	105.00 /	125.00
NC	ton	80.00 /	100.00
TM	ton	82.50 /	102.50
Car-Bel-Rez C	lb.	$0.126 /	$0.1451
Clays			
A. F. D. Filler	ton	29.50 /	36.00
Aiken	ton	14.00	
Albacar	ton	50.00 /	55.00
Barden R	ton	7.50 /	12.00
Buca	ton	45.00	
Burgess Iceberg	ton	50.00 /	80.00
Icecap K	ton	65.00 /	90.00
Burgess Pigment #20	ton	35.00 /	60.00
#30	ton	37.00 /	60.00
Catalpo	ton	35.00	
Champion	ton	14.50	
Crown	ton	14.00 /	33.00
Dixie	ton	14.50 /	15.00
Franklin	ton	13.50 /	35.25
GK Soft Clay	ton	11.00	
Harwick	ton	21.50 /	77.00
Hi-White R	ton	10.00 /	14.50
Hydratex R	ton	28.00	
Kaolloid	ton	10.50	
L. G. B.	ton	13.00 /	17.50
L. G. P.	ton	15.50 /	20.00
McNamee	ton	14.50 /	15.00
RX-43	ton	33.00	
Natka 1200	ton	12.00	
Par	ton	13.00 /	13.50
Paragon	ton	10.00 /	14.50
Pigment No. 33	ton	37.00	
Polyfil C	ton	25.00	
F	ton	45.00	
X	ton	30.00	
40	ton	40.00	
70	ton	53.00	
80	ton	65.00	
Recco	ton	14.00	
Sno-Brite	ton	12.50	
Stan-Clay	ton	28.00	
Stellar-R	ton	50.00	
Suprex	ton	10.00 /	14.50
Swanee	ton	12.50	
Whitetex	ton	50.00	
Windsor	ton	14.00 /	30.00
Witco No. 1	ton	14.00 /	30.00
No. 2	ton	13.50 /	30.00
Clearcarb	lb.	.1175/	.1255
Cumar Resins	lb.	.095 /	.19
Darex Resins	lb.	.42 /	.49
DC Silica	lb.	1.15 /	1.40
Diatomaceous silica	ton	32.00 /	48.00
Good-rite 2007	lb.	.36 /	.38
2057	lb.	.30 /	.31
Hi-Sil 233	lb.	.0825/	.0975
X303	lb.	.40 /	.45
Hycar 2001	lb.	.55	
2007	lb.	.39	
Indulins	lb.	.06 /	.08
Kralac A-EP	lb.	.43 /	.54
Laminar	ton	30.00	
Magnesium carbonate DCI	lb.	.11	
Magcarb L	lb.	.11 /	.14
Marbon Resins	lb.	.36 /	.43
Multifex MM	ton	117.50 /	137.50
Super	ton	167.50 /	187.50
Neville Resins			
465	lb.	.075 /	.08
LX-509	lb.	.33 /	.35
Nebony	lb.	.045 /	.05
Paradene	lb.	.07 /	.08
R	lb.	.145 /	.205
Para Resins 2457	lb.	.04 /	.045
Parapol S-Polymers	lb.	.44	
Picco Resins	lb.	.0850/	.19
Piccolyte Resins	lb.	.2225/	.2525
Piccoumaron Resins	lb.	.0875/	.19
Piccovars	lb.	.145 /	.20
Pliolite NR types	lb.	.98 /	1.33
S-3	lb.	.42 /	.49
-6	lb.	.36 /	.43
B	lb.	.36 /	.43
E	lb.	.36 /	.43
Plio-Tuf G85C	lb.	.52 /	.59
Purecal M	ton	56.75 /	71.75
SC, T	ton	110.00 /	125.00
U	ton	120.00 /	135.00
R-B-H 510	lb.	.15 /	.22
Resinex	lb.	.0375/	.0525
Rubber Resin LM-4	lb.	.28 /	.35
Silene EF	lb.	.06 /	.07
L	lb.	.0625/	.0725
Silvacons	ton	55.00 /	85.00
Transphalt	lb.	.0375/	.0575
Witcarb P	ton	117.50 /	153.50
R	ton	127.50 /	163.50
Regular	ton	60.00 /	96.00
Zeolex 23	lb.	.06 /	.07
Zinc oxide, commercial†	lb.	.145 /	.155

Retarders

Benzoic acid TBAO-2	lb.	.44	
Good-rite Vultrol	lb.	.62 /	.66
R-17 Resin	lb.	.1075/	.36
Retarder ASA	lb.	.57	
E-S-E-N	lb.	.39 /	.41
J	lb.	.68 /	.70
PD	lb.	.39 /	.41
W	lb.	.46 /	
Retardex	lb.	.47 /	.50
Thionex	lb.	1.14	
Wiltrol P	lb.	.37 /	.39

Solvents

Bondogen	lb.	.555 /	.605
Butyrolactone	lb.	.60 /	.65
Cosol #1	gal.	.37 /	.43
#2	gal.	.42 /	.48
Dichloro Pentanes	lb.	.04 /	.07

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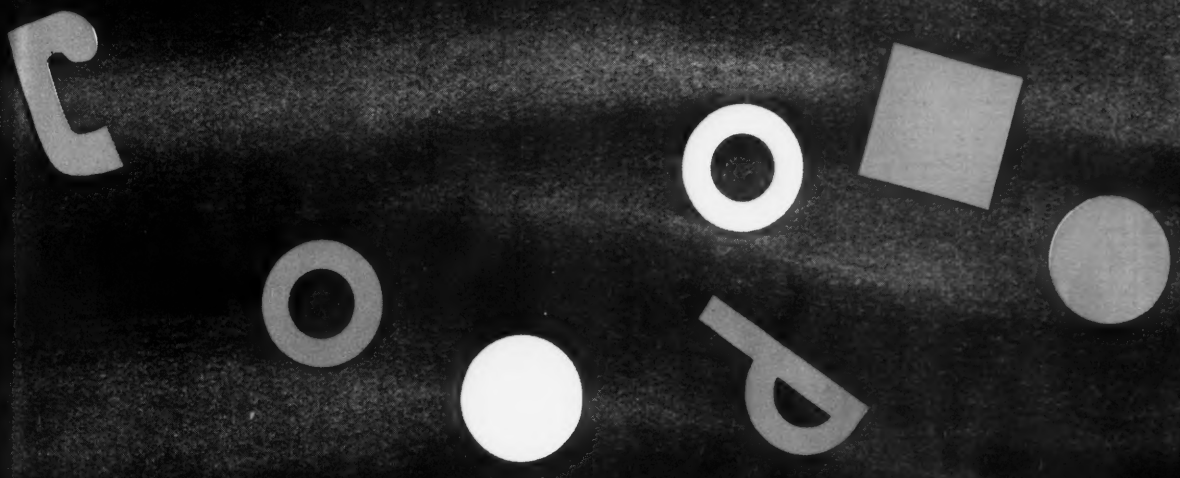
SILICONE NEWS from Dow Corning

SILASTIC LS
fluorosilicone rubber

is successfully solving design problems in sealing solvents, oils and fuels at temperatures from —100 to 350 F



Send for brochure detailing the benefits of Silastic® LS, the Dow Corning fluorosilicone rubber . . . Address Dept. 951

first in silicones

Dow Corning CORPORATION
MIDLAND, MICHIGAN

Dipentene DD, Sunny South	gal.	$0.42	$0.63
Ethylene dichloride, comml.	lb.	.09	.122
Hi-Flash 2-50-W	gal.	.41	
Pale yellow	gal.	.39	
LX-572	gal.	.27	.32
-748	gal.	.16	.23
Methyl-2-pyrrolidone	lb.	.75	.80
Neville Nos. 100, 104	gal.	.52	.60
106	gal.	.38	.46
Nevsolv H, 200	gal.	.19	.29
HF, T, 30	gal.	.24	.34
Penetrell	gal.	.42	.63
Picco Hi-Solv Solvents	gal.	.16	.48
Pine Oil DD, Sunny South	lb.	.15	
Skellysolve-B	gal.	.17	
-C	gal.	.162	
-H	gal.	.148	
-R, -V	gal.	.139	
Stauffer Carbon Disulfide	lb.	.0525/	.085
Tetrachloride	lb.	.0825/	.475

Tackifiers

Actinol DLR	lb.	.0625/	.085
Bardol, 639	lb.	.0275/	.0375
Borden, Arcco			
A25, A26, 716-30	lb.	.18	.19
555-40R	lb.	.185	.205
620-32B	lb.	.20	.21
716-35	lb.	.17	.18
1041-21	lb.	.165	.175
BRH 2	lb.	.0213/	.0351
Bunarex Resins	lb.	.065	.1225
Bunaweld 480	lb.	.24	
Chlorowax 70	lb.	.18	.24
Contogums	lb.	.0875/	.11
Cumar Resins	lb.	.095	.19
Galex W-100	lb.	.155	.17
W-100D	lb.	.1525/	.1625
Indopol H-35	gal.	.65	.84
H-50	gal.	.70	.89
-100	gal.	.85	1.08
-300	gal.	1.00	1.24
-1500	gal.	1.48	
L-10	gal.	.40	.59
-50	gal.	.45	.64
-100	gal.	.55	.74
Kenflex resins	lb.	.18	.27
Koresin	lb.	.90	1.10
Natac	lb.	$0.1685/	$0.1785
Nevindene	lb.	.15	.18
Picco Resins	lb.	.0875/	.19
Piccolastic Resins	lb.	.21	.27
Piccolyte Resins	lb.	.2225/	.2525
Piccopale Resins	lb.	.089	.13
Piccoumaron Resins	lb.	.0875/	.19
R B H 510	lb.	.15	.22
Roeflex 1118A	lb.	.39	
Synthetic 100	lb.	.41	
Synthol	lb.	.26	.3025
United	gal.	.69	1.20
Vistanex, LM grades	lb.	.45	

Vulcanizing Agents

Dibenzo G-M-F	lb.	2.60	
G-M-F #113, #117	lb.	.90	
Di-Cup	lb.	1.10	
Dodecenylsuccinicanhydride	lb.	.75	.76
HMDA-Carbamate	lb.	4.50	4.90
Ko Blend J, S	lb.	.39	
Litharge (*See Accelerator-Activators, Inorganic*)			
Magnesium oxide	lb.	.2525/	.38
DCI	lb.	.215	.235
601	lb.	.2525	
Maglite D, K, Y	lb.	.2525/	.28
M	lb.	.27	.30
Marmag	lb.	.23	.265
Michigan No. 1782	lb.	.2525/	.30
PSD 85	lb.	.37	.50
Red Lead (*See Accelerator-Activators, Inorganic*)			
Seamag	lb.	.20	.22
Sulfasan R	lb.	1.55	
Sulfur flour, comml.	100 lbs.	2.55	3.30
1018	lb.	.12	.1575
Aero	100 lbs.	2.40	7.75
Crystex	lb.	.195	.23
Insoluble 60	lb.	.125	.13
Rubbermakers	100 lbs.	2.65	4.55
Stauffer	lb.	.0265/	.054
Telloy	lb.	4.00	
V A 7	lb.	.50	
Vandex	lb.	7.00	
Vultac No. 2	lb.	.47	.74
3	lb.	.51	.78
White lead silicate (*See Accelerator-Activators, Inorganic*)			

Synthetic Rubbers

(Continued from page 116)

Philprene 6700	$0.175[b]	$0.181[b]
Plioflex 1703, 1773	.206[c]	.212[c]
1710C, 1712C	.1885[c]/	.1945[c]
1713	.175[c]	.181[c]
1714C	.1725[c]/	.1785[c]
1773	.206[c]	.212[c]
1778	.191[c]	.197[c]
Polysar Krynol 651		.1885[c]
652		.191[c]
S-1703		.195[a]
-1707		.18[a]
-1709, -1710, -1712		.1775[a]
-1778		.18[a]
Synpol 1703	.206[b]	.212[b]
1707, 1708	.191[b]	.197[b]
1712	.1885[b]/	.1945[b]
Synpol 8200	.191[b]	.197[b]
8201, 8208	.175[b]	.181[b]
8202	.1725[b]/	.1785[b]

Cold SBR Oil-Black Masterbatch

Ameripol 1805	.155[c]	.161[c]
1808	.148[c]	.154[c]
1809	.1545[c]/	.1605[c]
1810	.140[c]	.146[c]
4756	.1545[c]/	.1605[c]
4758	.145[c]	.151[c]
4759	.1598[c]/	.1658[c]
4760	.1576[c]/	.1636[c]
4761	.171[c]	.177[c]
B-142		.1515
Baytown 1801		.176[b]
1803		.174[b]
1811		.1569[b]
8775		.1545[b]
8776		.1679[b]
8777		.1550[b]
8778		.148[b]
8779		.1496[b]
8780		.1507[b]
8781		.1655[b]
8782		.1583[b]
8783		.1515[b]
Carbomix 1809, 1814		.1545[c]
1813		.164[c]
1808		.148[c]
1815		.1496[c]
1817		.1715[c]
3761		.1576[c]
3764		.1685[c]
Gentro-Jet 9250		.158
9251		.164
Gentro-Jet 9252		.167
9275		.150
OB 102		.1825[a]
-104		.1475[a]
-110		.141[a]
Philprene 1803	.174[b]	.18[b]
1805	.155[b]	.161[b]
1808	.148[b]	.154[b]
6753	.1496[b]/	.1556[b]
6755	.1715[b]/	.1775[b]
S-1800		.1475[a]
-1802		.141[a]
-1803		.165[a]
-1806		.151[a]
-1807		.154[a]
-1808		.142[a]
Synpol 8253	.1584[b]/	.1644[b]
8254	.1545[b]/	.1605[b]
8255	.148[b]	.154[b]
8267	.164[b]	.17[b]

Cold SBR Rosin Masterbatch

Copo 3900	.231[c]	.237[c]

Cold SBR Latex

CL-101		.28[a]
Copo 2101		.30[c]
2102, 2105, 2110		.32[c]
2108		.30[c]
2109		.2775[c]
3852	.30[a]	
FR S 2105	.32[c]	.366[c]
Naugatex 2105, 2107	.32[a]	.38[a]
2108	.30[a]	.38[a]
2113	.29[a]	.36[a]
Pliolite Latex 2101		.30[c]
2105, 2107		.32[c]
2108		.30[c]
Polysar Latex 721		.32[c]
S-2101		.26[a]
-2105		.28[a]
-2107		.32[a]
-2108		.29[a]

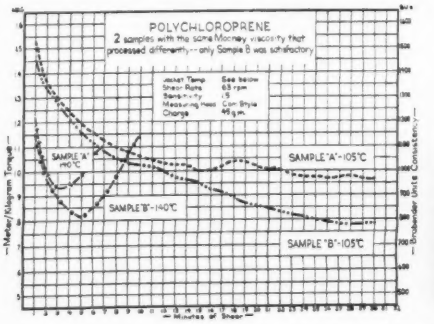
Misc. SBR

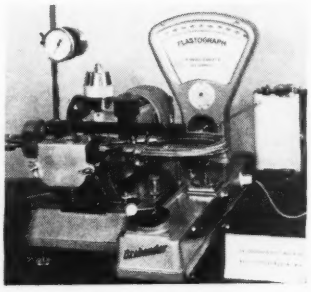
FR-S 110 (latex)	.3000[c]	
-150 (latex)	.3000[c]	
-174 (latex)	.2950[c]	
-176 (latex)	.2775[c]	
-182	.241[c]	.247[c]
-184	.1885[c]/	.1945[c]

Urethane Types

Adiprene L, LD-167, -213	1.15	1.65

BEFORE PRODUCTION BEGINS...
KNOW THE FLOW PROPERTIES OF YOUR ELASTOMERS


POLYCHLOROPRENE
2 samples with the same Mooney viscosity that processed differently -- only Sample B was satisfactory
SAMPLE 'A' 110°C
SAMPLE 'B' 140°C
SAMPLE 'A' 105°C
SAMPLE 'B' 105°C
— Meter/Kilogram Torque —
— Brabender Units Consistency —
— Minutes of Shear —



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- Decomposition Factors
- Temperature-Viscosity Relationship
- Production Rates

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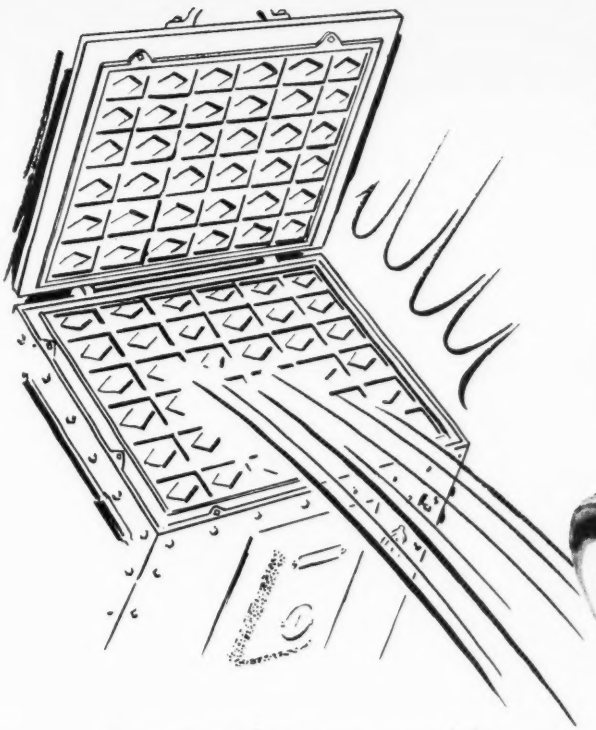

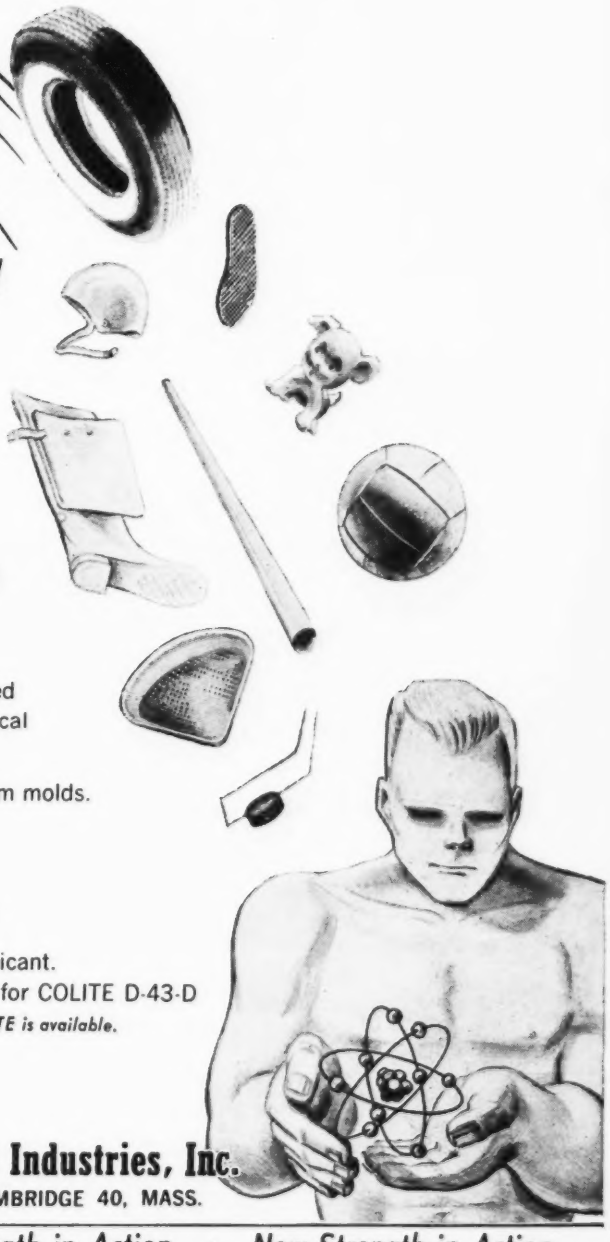

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Cut production costs!

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CONCENTRATE
the efficient and cost saving MOLD LUBRICANT

Colite Concentrate, high quality concentrated mold lubricant, is an effective and economical answer to many mold removal problems:

1. Simplifies removal of cured rubber from molds.
2. Leaves transparent satin-like finish
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6. May be used as a spray, sponge or lubricant.
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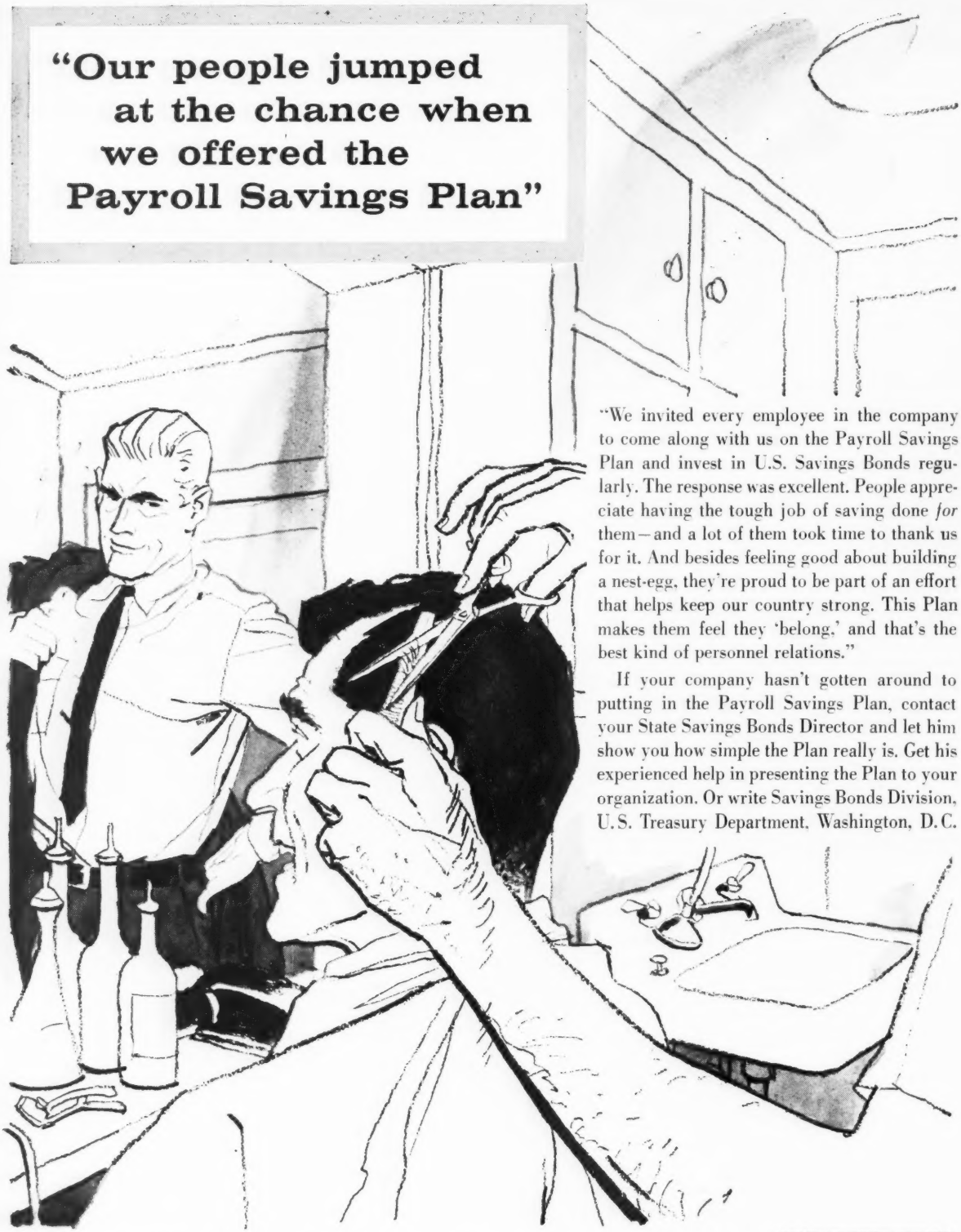
"Our people jumped at the chance when we offered the Payroll Savings Plan"



"We invited every employee in the company to come along with us on the Payroll Savings Plan and invest in U.S. Savings Bonds regularly. The response was excellent. People appreciate having the tough job of saving done *for* them—and a lot of them took time to thank us for it. And besides feeling good about building a nest-egg, they're proud to be part of an effort that helps keep our country strong. This Plan makes them feel they 'belong,' and that's the best kind of personnel relations."

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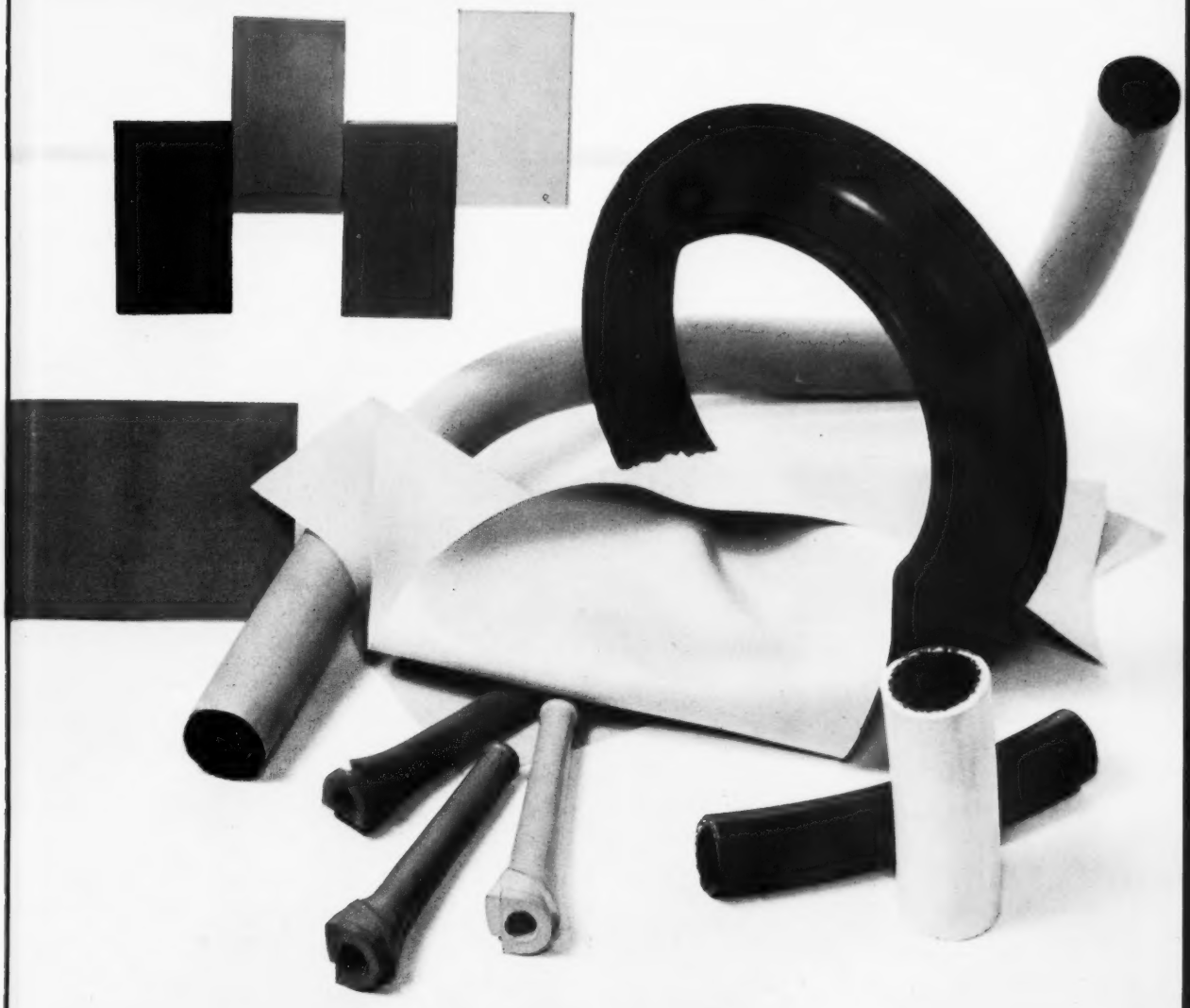

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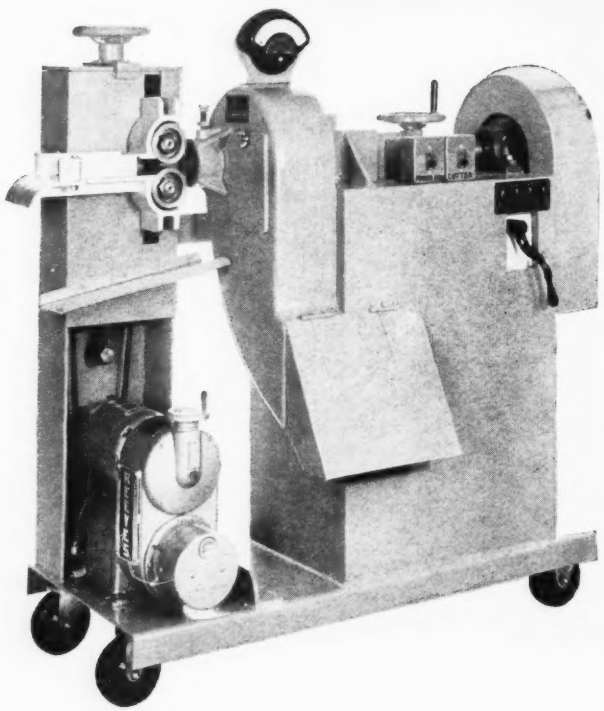

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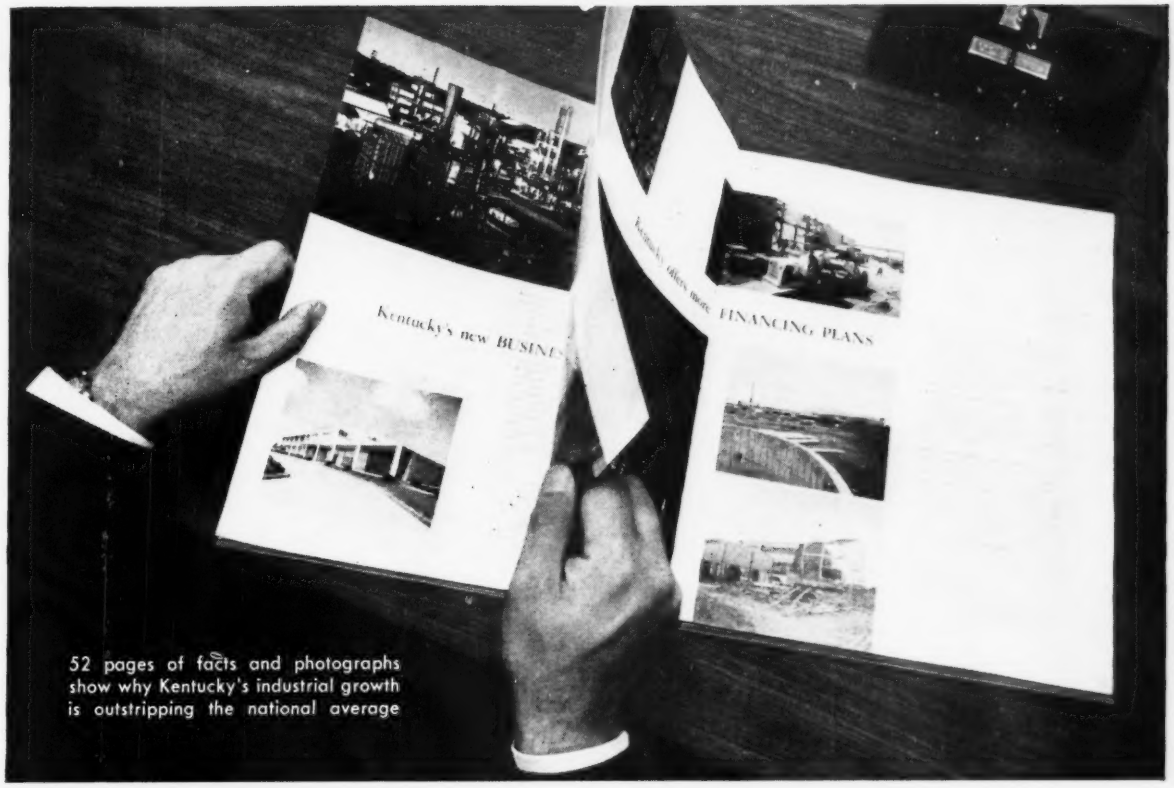

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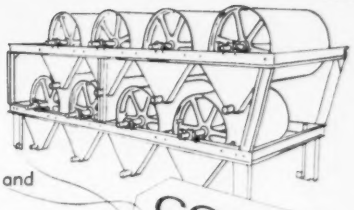
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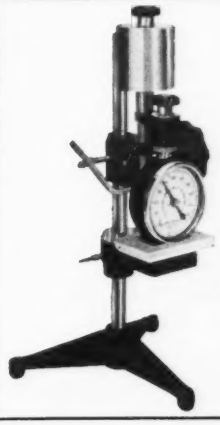
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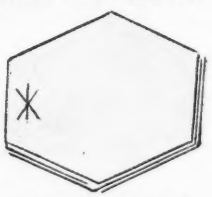

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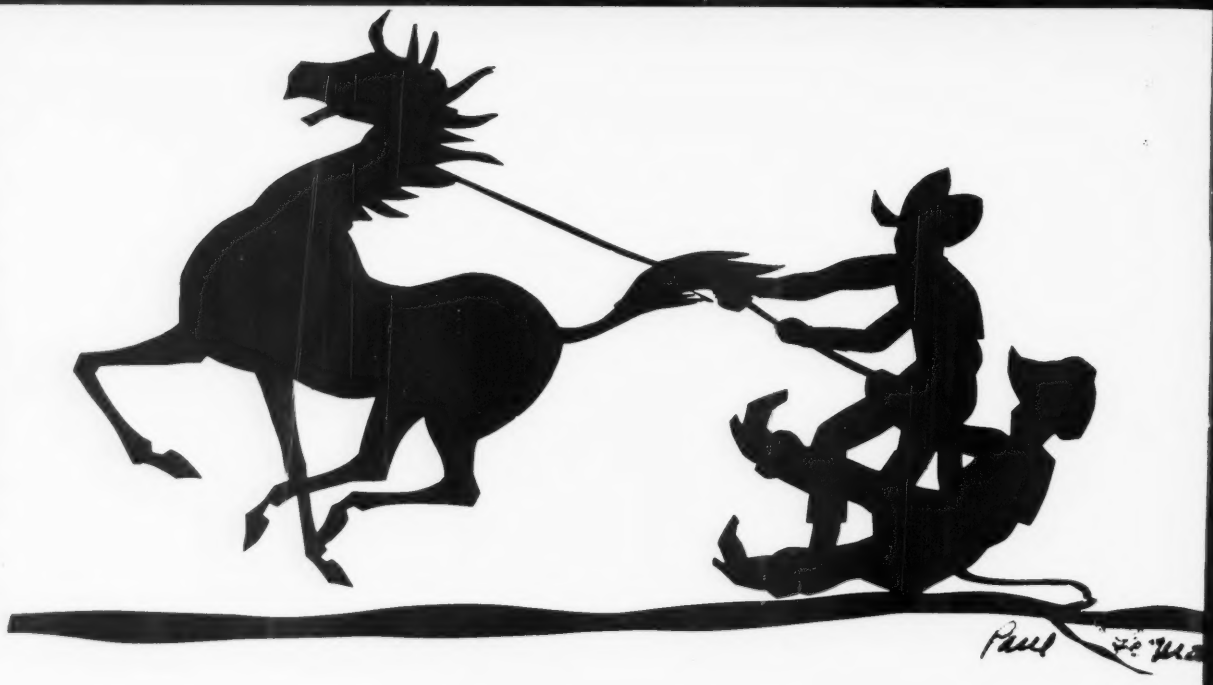

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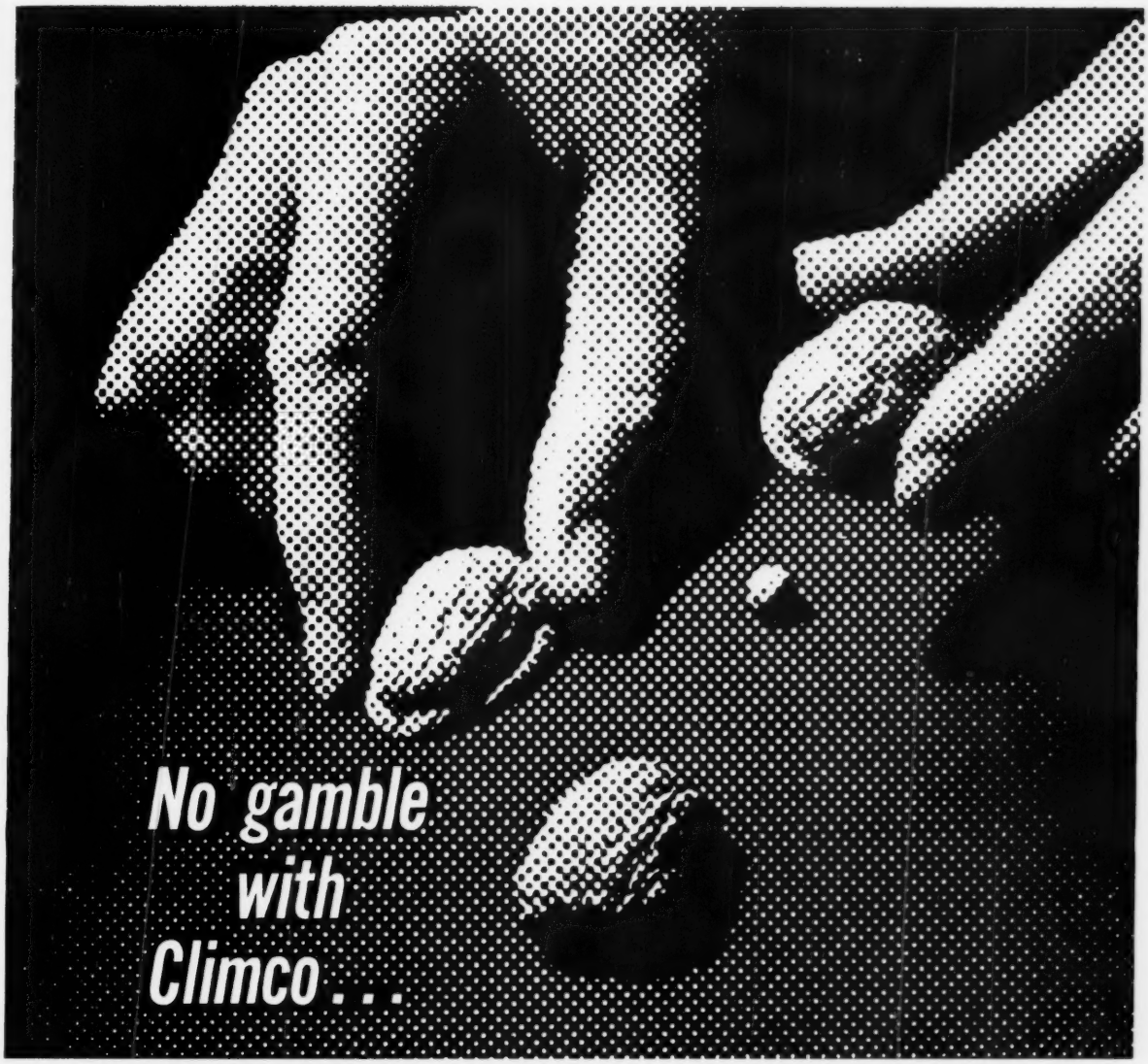

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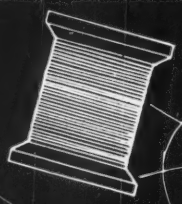

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